THE JOURNAL

OF THE

American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 168, NO. 11 — CHICAGO, ILLINOIS — NOVEMBER 15, 1958

COPYRIGHT, 1958, BY AMERICAN MEDICAL ASSOCIATION

ISOLATION STRESS IN MEDICAL AND MENTAL ILLNESS

Eugene Ziskind, M.D., Los Angeles

Sufficiently prolonged isolation from society or deprivation of sensory stimuli can produce mental abnormalities in the form of hallucinations, anxiety states, depression, and paranoid symptoms. Conditions likely to induce these phenomena occur clinically in patients kept in the dark after cataract operations, in persons with severe impairment of hearing, in poliomyelitic victims confined to respirators, in prisoners kept in solitary confinement, and in refugees handicapped by language difficulties. Monotony and isolation also affect certain occupational groups such as long distance truck drivers, monitors of radar screens, watchmen, and assembly-line workers. The underlying nervous mechanisms are not yet understood, but prevention and treatment are simple. This is well illustrated by the experience with cataract surgery, which in the past has been followed by psychoses in as many as 7% of cases. Since improvements of technique have permitted reduction of the period of bilateral bandaging of the eyes to one day or less, the incidence of postoperative psychosis has fallen below 1%.

THAT EXTREME isolation can produce mental abnormality has long been known to psychiatrists and social scientists. Recent experiments indicate that this reaction to isolation is universal. Does the newer knowledge aid in determining to what extent less extreme degrees of isolation are stressful in medical and mental illness? What is the mechanism of isolation stress? Can it be measured? These interrelated queries will be considered.

The early psychiatric references to isolation are to the paranoid psychoses of prisoners in solitary confinement,[1] the hard of hearing,[2] and the communication-deprived refugees.[3] Children reared in social isolation,[4] e. g., the famous case of Caspar Hauser, and those raised by animals, so-called feral men, have shown retarded mental development. Recently anecdotal accounts of isolation at the Arctic and Antarctic regions and at sea have attracted attention. Of even greater scientific interest is experimentally induced isolation.

Experimental Studies

Three experimental procedures of inducing isolation are currently best known. Each interferes with the usual sensory stimuli in a different and special way. The first report was by Heron and associates.[5] Healthy college students were paid $20 a day for as long as they would stay in a soundproof air-conditioned cubicle in a comfortable bed,

Clinical Professor of Psychiatry, University of Southern California School of Medicine.

Read before the Section on Nervous and Mental Diseases at the 107th Annual Meeting of the American Medical Association, San Francisco, June 25, 1958.

eyes covered completely by translucent ski goggles, and arms and hands restrained with cardboard sleeves. Provision was made for food and elimination. A communication device extended to the observer who was watching on the outside through a window. Most subjects terminated the experiment within three days because of anxiety, and those who persevered longer usually developed hallucinations. The latter were commonly visual, but occasionally auditory or tactile. The second method was carried out by Lilly,[6] with the subjects isolated under water up to three hours. In the third method, Solomon and his associates[7] confined subjects up to 36 hours in a specially prepared tank-type respirator (with the motor going, but the vents open). The final results of various methods show similarities. Interference with normal sensory stimulation in the isolation experiments accounts for the rapid induction and high incidence of stress and mental disability.

Each group of investigators set out to separate the subjects from other persons and to eliminate new meaningful sensory stimuli. For each objective the attainment was not absolute. Although all three methods impose changes in the intensity, variability, and finer discriminations of sensory stimuli, each has a different emphasis. That of Hebb is characterized chiefly by a reduction in the patterning of the stimuli, that of Lilly by a reduction in the absolute level of the stimuli, and that of Solomon by an imposed, unvarying, and repetitious structuring of the stimuli. Actually an important common feature is reduction in the variability of stimuli. The altered sensory input is the focus of study in current attempts to clarify the physiological mechanisms involved.

Since the experiments are characterized by special interference with sensory input in addition to isolation, the question arises "To what extent are the effects due to seclusion and to what extent to the alteration of sensory stimuli?" Sensory deprivation is always a concomitant of isolation in man, one reason being that the human voice is such a significant part of the total external stimuli. In fact, clinical material points up that interpersonal isolation alone, without special sensory interference, also produces stress and mental symptoms.

Isolation in Medical and Mental Illness

Conditions associated with special sensory interference will be discussed first. The most striking clinical example of isolation stress is seen among patients with postoperative cataract psychoses. After extraction of the cataract, the patient has the unoperated eye covered as well as the operated one because this cuts down the ocular movements which might interfere with healing. A small number of patients develop postoperative psychoses. The ophthalmological surgeons have known that the majority of such cases clear up quickly once the unoperated eye is uncovered. There is much evidence that elimination of visual stimuli in the isolated patient may produce a break with reality and that restoration of visibility usually suffices to dissipate the hallucinations and other mental symptoms.

As long ago as 1890 Frankl-Hochwart[8] wrote that the chief factor was the "Abschliessung von der Aussenwelt." He noted that the incidence of postoperative psychoses in cataract extraction was higher than that after other types of surgery— 7% in the 183 cases of the famous ophthalmologist Schnabel (1880). He also referred to the experience of Schmid-Rimpler with two nonalcoholic patients, suffering with iridochoroiditis and luetic iritis (19 and 57 years of age, respectively), who were placed in a darkened room and developed psychotic syndromes. In the latter half of the 19th century it was customary to place cataract patients preoperatively and postoperatively in a pitch black room. Schmid-Rimpler in 1863 already commented that this practice contributed to the incidence of psychotic disturbances.

Later a series of advances in operative technique resulted in a progressive reduction of the number of days of required bilateral bandages and a corresponding diminution of the cataract postoperative psychoses. In the earliest days the incision into the eyeball was left to heal without sutures, at which time both eyes were kept covered three or four days. In this period, the incidence of psychoses, as judged by the report of Parker (1913), was 3%. Then followed the general acceptance of conjunctival sutures (probably around 1930) when two or three days of bandaging of both eyes sufficed, and the psychoses were reduced to 1.5 or 2%.[9] With the introduction of deep corneoscleral sutures (generally practiced since about 1945), the bilateral bandaging could be reduced to one day or less. Correspondingly, the complicating psychoses dropped to less than 1%.[9]

So far the evidence of an etiological role for sensory deprivation in cataract postoperative psychoses is (1) greater incidence of this complication than after other types of surgery, where sensory deprivation does not occur; (2) disappearance of the psychosis in most cases when the unoperated eye is uncapped; and (3) progressive reduction in incidence of psychoses with advances in operative technique, thereby shortening the period of covering both eyes. Further approximation to the multiple sensory interference of the isolation experiments is the observation of Axenfeld (1925) that cataract patients were more susceptible to postoperative psychoses if they also had impaired hearing. Since it is among the aged that most postoperative cataract psychoses occur, it is of more than passing interest that senile patients with nocturnal delirium had the delirium reproduced in the daytime when placed in darkened rooms or when their

eyes were bandaged. Cameron[10] points out that these patients have a loss of retentive ability, so that visual images must be seen repeatedly for their identity to be maintained. The data from all these sources therefore strongly support the thesis that in the etiology of the postcataract extraction psychoses isolation with sensory (visual) deprivation plays an important role.

Another instance of sensory deprivation contributing to isolation pathology is seen in the paranoid psychoses of the hard of hearing. Here the literature is less extensive than in the cataract extractions and the evidence is not as conclusive. The literature includes clinical psychiatric impressions antedating Kraepelin's contribution,[11] indirect statistical studies,[12] and experimental studies.[13] Space does not permit discussion of the interesting psychological differences of visual as compared to auditory loss, particularly since the material is not germane to this thesis.

The mental disturbances reported by Mendelsohn and Foley[14] of patients with poliomyelitis confined to tank respirators present the clinical picture of "isolation psychoses." Other toxic or inflammatory processes appear to have been ruled out. Similar symptoms occurred in normal subjects confined to tank respirators. There are then at least three clinical disorders with special sensory limitations which seemingly parallel the isolation experiments.

Highly suggestive evidence of isolation as a stress, exclusive of special sensory restriction, are the psychoses of solitary confinement[1] and of language-isolated refugees.[3] Although the paranoid state is the usual type of psychosis attributed to isolation, I have now seen five cases of psychotic depression in women whose histories indicated long periods of relatively pronounced isolation preceding the onset of the mental symptoms. These depressions were devoid of paranoid trends. In seeming contradistinction is the report of Azima and Cramer (1956) that of five patients with psychotic depression who were subjected to isolation procedure (somewhat similar to that of Hebb) for three days, two experienced disappearance of the depression and three amelioration.

It has also been my clinical impression that patients with a single phobia which underwent a rapid and marked spread to many phobias, have families who permitted them a fair degree of isolation. The experience of Freud and others that active contravention is helpful in these cases supports the impression of the salutary influence of lack of isolation.

The possible relation of some senile psychoses to isolation certainly warrants investigation. The special vulnerability of the aged with visual and/or auditory impairment has already been noted. The adequate evaluation of isolation stress in older patients is made difficult by the fact that many such individuals are already close to mental decompensation. Acute stress of various types is often followed rather suddenly by a full-blown chronic brain syndrome in subjects not at all previously suspected of deterioration. There is need for a carefully controlled study contrasting the incidence and degree of prior isolation in matched groups of aged individuals with and without psychoses. I have such a study under way.

The evidence for interpersonal-isolation or seclusion per se as a stress factor in other medical illnesses also needs to be evaluated. Two physicians who were quite isolated during their hospitalization with coronary heart attacks developed depressions. Both were formerly out-going, active individuals and they themselves felt the isolation was a contributing factor to their depressions. The effects of relative isolation on patients confined to bed with casts, with paralyses, and with debilitating diseases call for evaluation. More study is needed to determine that additional contributory factors, such as latent predisposition to mental illness, toxicity, interference with cerebral circulation, or organic neurological involvement—peripheral or central—are not the significant etiological ones. The ready disappearance of recent mental symptoms on termination of the isolation (as occurs in typical solitary confinement prison psychoses) would favor seclusion as the significant causative factor.

Practical and Preventive Suggestions

Although there is need for more investigation before the degree and extent to which isolation constitutes a noxious factor in illness can be determined, several general therapeutic and preventive suggestions are warranted. Preference for two or more patients sharing a room, instead of private facilities; early ambulation for bed patients; activity programs in hospitals; frequent visitors; avoiding or minimizing hospitalization of the aged and very young (possibly substituting "rooming in" for both old and young); and plenty of light—at times, even during the night—might all be helpful in combating isolation tendencies. Some ophthalmological surgeons have preferred to extract cataracts in aged patients in the home to avoid removal from familiar surroundings. One might want to reevaluate the use of continuous tubs or the isolation of the old rest cures for the mentally ill.

On the preventive side, social participation and activity are well known as measures for avoiding or mitigating the harmful effects of seclusion. The isolating dangers of pregnancy and the infant rearing period, of occupational retirement, of the involutional period, and of old age and infirmity call for such intervention. The realistic hazards of isolation and sensory monotony have become a matter of public health concern for long distance night drivers of trucks on lonely roads, for monitors of radar screens, and for night sentinels, as well as the belt-line worker with repetitious, near-auto-

matic activity. It behooves us therefore to be alert to the hazards of undue isolation with or without special sensory privation in many life situations.

Mechanism of Isolation Stress

The mechanism is unknown whereby isolations, with or without special alteration of sensory stimuli, produces symptoms. Since the experiments emphasize interference with normal sensory stimulation, it is not surprising that implication of the functions of the ascending reticular system (ARS) should be suspected. There is, however, no direct proof of the involvement of this neurophysiological system. Indirect data are suggestive. Sensory input mediated through the ARS has been shown to be important for the functions of attention (and concentration), arousal, wakefulness, and consciousness.[15] A number of the known symptoms of isolation stress occur in dysfunction of the ARS.

The electroencephalographic (EEG) tracings of subjects under isolation stress [16] resemble the EEG's of persons with hallucinations produced by psychosomimetic drugs [17] or clinical states of toxic deliria.[18] (The hallucinations in the isolation experiments have been said to be like those produced by mescaline and lysergic acid diethylamide [LSD-25].) The EEG findings consist of a decrease in the percentage of alpha waves and in the appearance of slow waves. However, decreased percentage of "alpha time" or total suppression of the alpha rhythm is not synonymous with altered function in the ARS, and might presumably be due to impairment of other functions.

Direct assay of impaired functions of the ARS, as evidenced in the EEG, is being made by me in instances of isolation stress and hallucinatory states. The finding of Blum (1957) that alpha blocking is impaired in patients with chronic brain syndrome and schizophrenia and not in normal controls is pertinent. Blum's study is being repeated to ascertain whether this finding can be correlated positively with the presence of hallucinations and/or paranoid delusions. For the time being, the evidence for involvement of the ARS is only suggestive.

Another hypothesis pertaining to the interference with sensory stimuli is that of Bartlett (1951). He postulates that illusions and hallucinations may arise from distorted peripheral sensory stimuli replacing the normal ones. A patient in whom he extracted a cataract (as in another case reported in the literature) had hallucinations in a blind area which Bartlett attributed to abnormal sensory stimuli from the altered peripheral optic structures. He further refers to reports in the literature on phantom limb which support his thesis. Amputees with phantom limbs will often lose the perception of the hallucinated limb while the nerve endings in the operated stump are being tapped. It is Bartlett's contention that the transmission of normal sensory stimuli from the periphery is necessary for accurate central (perceptual) interpretation. In patients with blind and anesthetic areas there are usually no hallucinations. Only when peripheral structures create abnormal sensory stimuli, such as optic scars or amputation neuromas, is there abnormal perception. The normal sensory stimuli from tapping the neuroma replace the abnormal stimuli and the hallucinated limb disappears. Hebb and his group also support the role of varied sensory input for normal mentation. Is it possible that in the isolation experiments there is loss in the normal variability of stimuli (or some other alteration), so that realistic interpretations are no longer made—that the "corrective" influence of normal stimuli is absent under these conditions? This hypothesis warrants further analysis and testing.

Even though the exact mechanisms of isolation stress are not known, measurability of that stress would be of great clinical value. Such knowledge would perhaps enable one to differentiate those patients who break under isolation stress from those who do not; to differentiate when isolation in any illness, or a certain special illness, plays a significant etiological role. With this end in mind, my current research includes the measuring of plasma 17-hydroxycorticosterone (compound F) and catecholamines before, during, and after the height of the stress. If the stress can be measured, solution of both experimental and clinical problems of isolation should make much more rapid progress.

Conclusions

Paranoid states in persons subjected to solitary confinement, in the hard of hearing, and in language-deprived refugees are clinical reference to the harmful effects of isolation, known to psychiatrists for a long time. The history of the psychotic complications of cataract surgery reveals the great similarity, both as to origin and as to type, between these mental disturbances and those noted in recent experimental "sensory deprivation." Other medical and surgical illnesses should be reviewed for possible harmful effects of isolation, particularly among the aged.

Improvements in medical care and prophylactic measures based on avoidance of isolation stress can be recommended even now. The isolation stress may be due to interference with mediation of sensory functions via the ascending reticular system. The evidence is still inconclusive. Electroencephalographic studies are under way to investigate this point. Measurement of isolation stress would promote objectivity in the clinical and experimental studies. Perhaps the determination of the level of plasma 17-hydroxycorticosteroids and the catecholamines will serve this purpose.

2007 Wilshire Blvd. (57).

References

1. Nitsche, P., and Wilmanns, K.: History of Prison Psychoses, Nervous and Mental Disease Monograph 13, New York, Nervous and Mental Disease Publishing Company, 1912.

2. Braun, E.: Psychogene Reaktionen (Isolierung und Induktion), in Bumke, O., Handbuch der Geisteskrankheiten, Berlin, Springer-Verlag, 1930, vol. 5, pp. 208-217.

3. Allers, R.: Ueber psychogene Störungen in sprachfremder umgebung, Ztschr. f. d. ges. Neurol. & Psychiat. **60**:281-289, 1920.

4. Davis, K.: Final Note on Case of Extreme Isolation, Am. J. Sociol. **52**:432-437, 1946-1947.

5. Heron, W.; Bexton, W. H.; and Hebb, D. O.: Cognitive Effects of Decreased Variation to Sensory Environment, Am. Psychol. **8**:366 (Aug.) 1953.

6. Lilly, J. C.: Mental Effects of Reduction of Ordinary Levels of Physical Stimuli on Intact, Healthy Persons, Psychiat. Res. Rep. **5**:1-9 (June) 1956.

7. Solomon, P.; Leiderman, P. H.; Mendelson, J.; and Wexler, D.: Sensory Deprivation: Review, Am. J. Psychiat. **114**:357-363 (Oct.) 1957.

8. Von Frankl-Hochwart, L.: Über Psychosen nach Augenoperationen, Jahrb. f. Psychiat. **9**:152-182, 1890.

9. Beigelman, M.: Personal communication to the author.

10. Cameron, D. E.: Studies in Senile Nocturnal Delirium, Psychiatric Quart. **15**:47-53 (Jan.) 1941.

11. Kraepelin, E., cited by Ast, F.: Die Behandlung schwer erregter Geisteskranker, Allg. Ztschr. f. Psychiat. **86**:138-155, 1927.

12. Houston, F., and Royse, A. B.: Relationship Between Deafness and Psychotic Illness, J. Ment. Sc. **100**:990-993 (Oct.) 1954.

13. Hebb, D. O.; Heath, E. S.; and Stuart, E. A.: Experimental Deafness, Canad. J. Psychol. **8**:152-156 (Sept.) 1954.

14. Mendelsohn, J. H., and Foley, J. M.: Abnormality of Mental Function Affecting Patients with Poliomyelitis in Tank-type Respirator, Tr. Am. Neurol. A. **81**:134-138, 1956.

15. Moruzzi, G., and Magoun, H. W.: Brain Stem Reticular Formation and Activation of EEG, Electroencephalog. & Clin. Neurophysiol. **1**:455-473 (Nov.) 1949.

16. Heron, W.; Doane, B. K.; and Scott, T. H.: Visual Disturbances After Prolonged Perceptual Isolation, Canad. J. Psychol. **10**:13-18 (March) 1956.

17. Chweitzer, A.; Geblewicz, E.; and Liberson, W.: Action de la mescaline sur les ondes α (rhythme de Berger) chez l'homme, Compt. rend. Soc. de biol. **124**:1296-1299 (April) 1937.

18. Romano, J., and Engle, G. L.: Delirium: Electroencephalographic Data, Arch. Neurol. & Psychiat. **51**:356-377 (April) 1944.

DESIRABLE ATHLETICS FOR CHILDREN

George Maksim, M.D., Washington, D. C.

A program of athletics for children should be such as to contribute to their total fitness, which embraces physical, mental, emotional, moral, social, and spiritual values. Such a program should enlist children not as spectators but as participants and should therefore be adapted to the developmental level of the children. It should be diversified rather than one-sided and should not involve the physical risks of such sports as boxing and tackle football. It should be confined to the local community, and the participation of children in national competition is to be deprecated. A program that is backed by a group of informed and mature adults, is planned with the best interests of the children in mind, and gives opportunities to the slow learners and the handicapped deserves to be encouraged and helped by the physicians of the community.

"What are desirable athletics for children?" This is a question that can be quite properly raised in this era of discussion pertaining to fitness of American youth. Some of the leaders in discussions in this area would purport that their ideas of a suitable program of athletics will produce optimal fitness of youth. It would be well here to pause and consider what is meant by youth fitness and what part athletics should play in its promotion.

Fitness for Living

We are really seeking the total fitness not only of the young but of all individuals. This has always been a goal of members of the medical profession. It is particularly true among those of the profession who supervise the growth and development of infants and children. The term "fitness" has been variously defined, but essentially it should mean the total well-being of each individual during his formative years and in adult life. It does not mean simply the absence of illness or the existence of superior muscle strength or agility.

An interest in fitness, however the term may be defined, is not new to American physicians. It has been of concern to members of the American Medical Association since its organization in 1847. Public health physicians also have had an avid interest in, and concern for, health protection and, therefore,

Read in the Symposium on Competitive Athletics in Children before the Joint Meeting of the Section on Pediatrics and the Section on Preventive Medicine at the 107th Annual Meeting of the American Medical Association, San Francisco, June 26, 1958.

the development of fitness ever since local governments assumed any responsibility for public health.

We Americans have always had an understandable pride in our physical and moral strength. Generations have gloried in the courage and hardihood of the early settlers, the endurance of the pioneers who broke the wilderness, the capacity of young men to survive in the wars, the ability of our people to adjust to the stresses of a complex civilization.

The question now is, "Are we fit to cope with the tasks of our time?" Today, America finds itself in a complex world situation that is uncertain in the demands made on the physical, mental, moral, and spiritual resources of the people. It is a period when our nation must be strong. It is a time when all of us—physicians, teachers, and all citizens—have increased obligations and opportunities with respect to fitness for living.

It would be well here to make some further comment about the definition of fitness. As I implied earlier, some think that fitness is related solely to measurement of strength and flexibility of certain muscles. The following story was presented on the radio some months ago:

> They say Africa is a continent of strange contrasts. And Mal Whitfield, America's two-time Olympic 800-meter champ certainly agrees. He learned first hand on a recent State Department goodwill tour. Whitfield was supposed to show a group of natives something about physical training. Mal did a push-up and then asked his group to do likewise. One native after another tried but no one succeeded. Exasperated, Mal tried a different exercise. Just then one of the natives leaped over a fence and disappeared. Whitfield was bug-eyed. The fence was a shade over seven feet high. Then another native raced past him and into the forest. "Where's he going?" Whitfield inquired. "To catch an antelope," was the answer. Mal shook his head and walked away muttering to himself, "And they couldn't do a push-up."

These, and many other illustrations might well pose the question, "Fitness for what?"

We should always continue to think of the total fitness of the total child, and, may I repeat, a true concept of fitness embraces physical, mental, emotional, moral, social, and spiritual values. It includes every child, the handicapped and his rehabilitation, as well as those who are "whole."

Desirable athletics for children may make their contribution to the total fitness of the child, the youth, and the adult in several ways. Before we proceed to more detailed discussion I would like to clarify two points. First, we are discussing children 12 years of age and under (those in the pre-teen-age group), and, second, nothing which is said here must be construed as indicating denial of competition to the growing child. This cannot be done, since competition is an inherent characteristic of the growing individual. He competes with himself or others in his environment. Competition is part of our American way of life.

Characteristics of Sports Programs

There are certain characteristics about athletic or sports programs for the age group to which we refer that should be kept in mind. In fact, certain features should be emphasized and reemphasized.

Sex.—In the preadolescent group, both boys and girls should be considered equally. Girls in this early age should not be mere spectators but should be participants. Members of both sexes should have an introduction to athletics even at the pre-school-age level—in the home or the nursery school environment. It is at this level that mastery of the coarser movements of the body should be attempted without any emphasis on winning or success. The effort should well be in the direction of improvement over past performance.

Developmental Level.—All athletic activities should be geared to the developmental level of each child and not to his weight or chronological age. Children in this immature, growing, developing stage have varying rates of gradual, or more rapid, change from the clumsy, coarse, gross movements to the more refined, coordinated, and accurate movements of skill. Running, catching, throwing, and other physical activities in athletics, sports, and games are at first quite awkward and inaccurate, but in the years to come the child may develop into a gracefulness and achievement that could not be anticipated.

Diversity of Opportunity.—All athletic and sports activities of the elementary school child should be so arranged that there is an opportunity to participate in many activities throughout the year, within and without the school program. These activities should range from ordinary calisthenics through the various sports programs in a well-regulated physical education department in the schools. These activities should be mandatory within the degree of ability of each individual child. The amount of physical exercise outside of the program is often unpredictable. Undue concentration on any one sport at this age level has rarely developed a "star." On the other hand, a program in which a diversity of opportunity is available has, on many occasions, demonstrated, as maturation occurred, latent ability in athletics that neither the parents nor other adults had suspected were present.

Perhaps it would be well if more children in this age group could follow the philosophy expressed by "'Where Did You Go?'—'Out.' 'What Did You Do?'—'Nothing'"—a recent popular book by Robert Paul Smith. Children in this age range should not be pressured into receiving adult acceptance by conforming to a rigid, highly organized, and highly competitive program in any of the sports. All sports programs should give all children an opportunity to participate, especially those with seemingly less natural aptitude. The natural athlete will emerge despite any programs.

Any program in any sport for the younger child should be confined to the local community. It is highly questionable whether state or national tournaments, or any large-scale exhibition programs, promote the maturation of a child into a youth with total fitness. The recent report by the School Health Committee of the American Academy of Pediatrics on the subject of competitive athletics recommends that contact sports, such as tackle football and boxing, not be considered as desirable athletic activities. The former has risks, and the latter also has risks and an undesirable philosophy.

I would like to take opportunity at this time to commend the program of Long Beach, Calif. This, as reported, seems to eliminate the undesirable adult pressures of programs in various sports, particularly baseball.

It has recently been reported that this year's Little League Baseball program has changed from a national to an international one, with many countries participating. Certainly, we are all currently aware that there is a great need for more international relationships, but is this the level at which it should be attempted, with a small, select, minority group of early matured children competing? Again, all youngsters, not just the natural athletes, should have opportunities for participation. Furthermore, this participation should be for the benefit of the child and should not be used as an attempt to bind faltering family relationships.

Program Planning and Supervision for Optimal Growth and Development

All athletic programs in the prepubescent age range should be planned in the best interest of optimal growth and development—physical and emotional. They should be fun and part of the joy of living and serve as a wholesome outlet for the normal energy and exuberance of the young, as well as a constructive and beneficial learning experience. Overemphasis on any one activity may produce in the boy or girl a situation where the borderline between healthy fatigue and harmful exhaustion is trespassed. The failure to win graciously or to lose stoically may be equally harmful in the emotional growth and development of a child. The picture of a boy crying after some athletic contest might be excused by some with the comments that "it did him some good to cry." However, the first question that comes to mind is "did he need to cry at all" over a childhood athletic contest which is only a stepping stone to other and more important contests?

This optimal physical and emotional growth and development should be the primary concern of all adults—parents, physicians, teachers, and recreation leaders in programs of desirable athletics for children 12 years of age and under. It is at this level that the first steps are taken toward a development of total fitness in youth to result in a happy, well-integrated adult.

Conclusions

Certain salient features for a program of desirable athletics for children may be enumerated. First, a desirable program is one which is enthusiastically accepted by the community, one which is worked out through the combined efforts of all concerned—the parents, teachers, recreation leaders, and the physicians in the community who can act as advisors. It should not include contact sports.

Second, the health aspects should be clearly set forth. Every child should have, in addition to his annual physical examination, a complete medical examination before participating to any degree in a formalized program of athletics. An injured or ill child should have the approval of his physician before rejoining the athletic program.

Third, there should be an informed, emotionally stable group of adults behind every program of athletics. Parent-teacher associations and other civic leaders can exert an influence in this direction which will provide for the better utilization of existing facilities, as well as provision for necessary facilities where they do not exist. Gymnasiums should not be changed to science classrooms and laboratories—we need both.

Fourth, all desirable physical education and athletic programs should be for all children and suited to their developmental levels, and they should make provision not only for the talented but for the slow learners and the handicapped.

Finally, it is not only the physician's concern but his responsibility to exert his influence and assist in the development of programs of desirable athletics which will have as their primary interest the total well-being of the total child and the prevention of potential inadequacies when that child reaches adult life.

1418 Goodhope Rd. S. E.

THE OLDEST LIFE INSURANCE COMPANY.—The first life insurance company, "The Corporation for Relief of Poor and Distressed Presbyterian Ministers and of the Poor and Distressed Widows and Children of Presbyterian Ministers," was established [in 1759] in Philadelphia by the Synod of the Presbyterian Church. This company, now Presbyterian Ministers' Fund, is the oldest life insurance company in continued existence in the world.—Life Insurance Fact Book, Institute of Life Insurance, New York, 1957.

EDUCATIONAL ASPECTS OF ATHLETICS FOR CHILDREN

Fred V. Hein, Ph.D., Chicago

A program of athletics is important in the education of young children, and competition is a vital part of the experience. But competition is excessive if it results in emotional stress beyond the capacities of a child, entails undue risk of permanent physical deformity, or diverts so much of the school's equipment, attention, and time to a few physically gifted children as to deprive many others of opportunity for participation. The ideal athletic program provides opportunities for all boys and girls; it should be diversified and graded. It should be planned in a way that will not permit exploitation of children by adults for selfish or commercial reasons, and the motivations provided by occasional interscholastic events should be used to bring the benefits of active sports participation to the greatest possible number of children.

Few problems have been subject to as much misquotation, distortion, and misinterpretation as the issue of athletics for children and youth. So before getting to the basic problem it may be helpful to clear away a number of side issues that have frequently caused trouble in such discussions.

Educators, like the medical profession, are divided on some of the issues involved. But there is a body of reference such as the views expressed by the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association. Pertinent recommendations, reflecting the combined views of educators and physicians, are also available in the reports of the National Conferences on Physicians and Schools, sponsored by the American Medical Association.

Such groups have strongly favored competitive sports for children and youth at suitable age periods, of appropriate kinds and under proper supervision. In fact, they suggest more competition in more sports, with more teams, and more individual activities for more children of both sexes. However, the word controlled should be emphasized. One may wish to control competition in terms of the maturity of the competitors, but this can in no way be interpreted as being against competition. A common misrepresentation is to label anyone who proposes athletic controls as being opposed to competitive sports. On the contrary, those who advocate such regulation do so in the best interests of athletics. It is only through proper regulation that sports can provide their optimum benefits for children and youth.

Not every aspect of education can be predicated on objective evidence. Experience must have its due and there is still a place for reason, logic, and interpolation in human affairs. In developing our programs of sports for children and youth, we should certainly utilize every bit of objective evidence that is available to us. But in the absence of such evidence and for problems that do not lend themselves to objective research, we must rely on reason and common sense.

Definitions

One of our problems in discussing what is desirable in a sports program for children and youth is definition of terms. For purposes of this discussion, we are concerned primarily with children of upper elementary and lower junior high school age. As a general rule these youngsters will be under 13 years of age and in grades below the ninth. Athletics and sports are used synonymously to include individual, low organized and team games, and also tumbling, rhythms, and conditioning activities. Competition is used broadly to cover competition against one's own past record, against other individuals, and as a member of a team against another group.

The terms "high-pressure program" and varsity-type program are used to indicate an athletic program for young children which simulates that of the colleges or professional sports. These terms refer to programs for young children which include championship schedules, long-distance travel, all-star teams, tournaments, bowl games, and the like. They also refer to any type of athletic program which is developed in terms of adult satisfaction rather than the needs of children and youth.

Competition and Cooperation

This brings us to the matter of cooperation in relation to competition. We need to look carefully at these two terms. They are not, as some people would have it, in conflict with each other. Competition is a part of our way of life, a valued American heritage. To it we attribute much of our progress in science and industry, our superior standard of living. Cooperation also is an essential factor in human affairs. Many of our endeavors depend for

From the Bureau of Health Education, American Medical Association.

Read in the Symposium on Competitive Athletics in Children before the Joint Meeting of the Section on Pediatrics and the Section on Preventive Medicine at the 107th Annual Meeting of the American Medical Association, San Francisco, June 26, 1958.

their success on the quality of cooperation achieved. A happy mixture of the two, competition and cooperation, makes for effective living in a democracy.

The ability to compete ethically and to cooperate effectively must be learned; no one is born with these skills. Athletics furnish one medium for such learnings—both competitive and cooperative. The player must do his part as an individual competitor but must also cooperate with other members of the team. Athletics then require a mingling of competitive and cooperative effort analogous to real life. Because they are so absorbing to youth they have their own self-contained motivation. This makes properly developed athletics particularly potent as a means of education for both competition and cooperation.

Our discussion here is confined to the former but not with the question of competition versus no competition. Competing is an inherent part of living and learning. To even suggest its elimination is ridiculous. So our problem is to decide on the desirable intensity of competition for the younger age group and to outline the kind of athletic program that will permit us to maintain this desirable intensity. In attempting to do this we must look at both health and education factors. Educators rightly turn to physicians and physiologists for guidance relating to the health aspects of athletics. But queries concerning the effects of varsity-type athletic competition on young children bring varied answers:

Rowe [1] and Fait [2] conclude from studies that young participants in interscholastic sports do not grow as well as those having a well-organized physical education program. McCraw [3] reporting the results of another study indicates that those taking part in interscholastic sports show a greater rate of growth and physical development.

Lowman [4] surveyed his orthopedic colleagues and found the great majority opposed to "varsity-type" interscholastic competition below the ninth grade. Fait [2] a few years later, with the question worded somewhat differently, reported that a majority of orthopedists responding made the opposite kind of response.

Promoters of midget football leagues point to their records of relatively few apparent injuries as proof that the sport is as safe for youngsters as for their older brethren. But studies of injuries at the high school level [5] show that the younger and greener a youth the more likely he is to injury. That all serious injuries are not apparent was demonstrated when x-ray studies of so-called insignificant injuries revealed 14 fractures.[6]

Similarly, it has been indicated that susceptibility to epiphysial injury in the young athlete is not sufficient to contraindicate high pressure competition in contact sports.[2] However, Hibberts' analysis of football injuries [5] shows that one out of five participants will sustain an injury. Of these injuries one out of five will be a fractured bone. Other reports [7] suggest that in fractures of the growth areas of long bones in youngsters about one out of eight will give trouble with possible deformity in spite of the best of medical care. It has also been pointed out that the hazards in this connection are greatest in contact sports such as football.

Another facet of the injury problem is related to what Lowman [4] labels "wear and tear" on the immature organism. He suggests that acute trauma may be less important than continuing minute trauma to the growing skeleton. Early arthritic changes, low back and sciatic symptoms, and other similar problems, he feels, can frequently be attributed to the cumulative effects of such minute trauma. The counter argument is, however, that those youngsters able to make the high-powered teams are more mature physiologically than their fellows [8] and consequently can stand up under the stresses of sports without such harm. And so the controversy continues.

"But what about the effects on emotional health?" the educator asks. There have been attempts to get at this experimentally: In one study employing a galvanometer-type instrument,[9] reactions of boys to their ordinary physical education activities were found to be as pronounced as those evidenced in connection with varsity-type contests. On the other hand, in another study comparing simulated pressure situations in sports with those in which pressure factors were not introduced [10] reactions of participants differed markedly. As high as 30% experienced nausea in the pressure situation while only one boy was so affected among all the participants under nonpressure conditions.

In a survey of parental opinion about sleep and sports a large majority of parents said that the participation of their youngsters in varsity-type games did not interfere with sleep." On the other hand, Giddings [11] in sleep studies using standard levels of motility, as a measure of soundness of sleep, found that, in young players, highly competitive sports measurably interfered with the depth and nature of sleep.

Certain objective evidence probably relating to emotions and injuries is indirectly available. Athletic injury statistics show four or five times as many serious injuries in games as in practice periods [5]—this in spite of the fact that the time spent in practice ordinarily averages a great deal longer. The higher proportion of injuries in the highly organized situation can probably be traced to accompanying tensions and pressures. Therefore, the implication is that the high pressure conditions will create a far greater injury hazard. But those who do not agree say that these statistics are from studies of older age groups—high school and college. "How do you know they will apply for the younger, more plastic children?" they ask.

Also, on the emotional side psychiatrists and psychologists have been polled as to their feeling about the effect of high pressure sports on young children. There was general agreement that high pressure elements are detrimental at this age level.[12] But they point out that such elements are not part of the athletics themselves but of the conditions surrounding them. These, the mental health experts say, should be eliminated or controlled. This is easier said than done, however, and they offer no specific formula for such control.

There is no lack of agreement among physicians or among educators concerning the need for medical controls in sports for youngsters. Everyone recognizes the need for a medical examination prior to the season of participation, for a physician being in attendance at contests in strenuous or body-contact sports, for medical determination of ability to return to play following an injury, and other such controls. It is only on the question of the desirable intensity of the competition that disagreement exists.

Educational Considerations

Where does this lack of agreement on the effects, physical and emotional, of high pressure programs leave us? It implies that the decision as to the intensity of athletics for children must be predicated largely on educational considerations. Let us examine some of these factors that need to be evaluated:

Growth Factors.—Child growth and development specialists point out that the chief business of the growing child is to grow. Growth is a highly demanding energy-consuming process with which nothing must be allowed to interfere.[13] Rational activity will assist growth, but unreasonable stress, emotional or physical, can have the opposite effect. The child may be pushed into a fatigue cycle [14]—fatigue, impaired nutrition, impaired general health, decreased ability to rest, greater fatigue—again around the cycle.

Learning and Emotions.—Psychiatrists and psychologists agree that growth toward mental-emotional maturity and stability must be a gradual process. We do not teach children to swim emotionally by throwing them into an emotional stream beyond their depth.[15] On the other hand, we do not help them to learn how to handle their emotions by removing the problems and situations that generate emotions. For the growing child, the emotional hurdles must be neither too high nor too low; they must be consistent with mental-emotional maturity. It is the eventual task of educational leadership to evolve a graduated curriculum for emotional growth based on such principles.

Education in Values.—Football fever or hoop hysteria need not be serious diseases. Within reasonable limits they are probably good for school, community, and even national morale. Certainly they are a part of today's culture. But for most people these are transient things, held somewhat apart from the workaday world. When they become one's only world, trouble is ahead. In today's society it is easy for the athlete to feel that sports make the world go around, or at least make education go around. This is a snare and delusion except for a relative handful who will earn their living as professional athletes. For the rest such a false set of values is completely unrealistic. It is the task of education to develop its athletic programs so as to place sports in their proper perspective in total living.

Motivation of Sponsors.—Adult volunteers who give their services unselfishly to children deserve our highest commendation. The great majority who urge or promote high-powered sports for children are honest in their convictions. They feel strongly that such promotions are good for boys and girls. The same can be said for a great many parents. But child psychiatrists suggest that the motives of such parents and volunteers be examined and reexamined to be certain they are what they seem,[16] and that they stay that way. Do the inner motives jibe with those that show on the surface? Is there a desire to relive athletic successes in the child? Or conversely is there a wish to make up for youthful athletic frustrations? Does the role of coach or manager have an inordinate appeal in relation to the concern for children? These are only a few of the questions that need to be asked.

Social Learnings.—We claim certain social values for athletics; educators would be the last to deny these. Sports, properly guided, can help to build qualities like loyalty, courage, and over-all good sportsmanship. They can contribute to the development of leadership ability. They can teach the importance of both individual effort and team play. But all of these values and some others can be realized for children right in their own schools and communities without high-powered tournaments, bowl games, and the like. To claim any special social values for an athletic trip across the state or nation is simply not facing facts. These same values could be gained from a band tournament, outing activities, an educational excursion, or simply a trip with family or friends.

Educational Exploration.—Most of us would probably agree that interests are founded largely on experience. Children learn to know and enjoy a variety of sports only by participation in them. If they are to develop broad interests there should be opportunity for wide athletic exploration during the upper elementary and early junior high school years. By introducing high pressure, varsity-type programs at this most impressionable age, we tend to crowd out other activities, and encourage early specialization. Thus we deprive children of many other sports experiences as well as the opportunity for participation in a variety of other developmental activities. Also, by centering attention on the so-

called major sports, to the exclusion of others, we sow the seeds for "spectatoritis" in later life. Few people participate in the major sports past age 25. And few people who have not learned to enjoy the minor sports in childhood will be converted to the active life in adulthood.

Learning Skills.—Experience indicates that children can learn sports skills much earlier than has commonly been thought. Interestingly enough, however, the earlier they are learned the sooner interest seems to drop off in the average individual. With the exception of the star performer, there seems to be a fairly constant interest-span for participation in a given sport. Educationally, then, the problem becomes one of determining when children are ready for best learning in a given activity and over what period the experiences provided will be of greatest value to them.

No one should or could justify a sports program for young children designed solely as a "farm-system" for high school and college teams. But there is nothing wrong with the concomitant development of good performers through a program designed for children as they are. Harry Combes, coach of the University of Illinois basketball team, writing with Clyde Knapp [17] contends that an extensive program for all is better training for over-all future athletic success than intensive competition for a few. The early maturers who receive all the attention in the intensive program may not be the best prospects in high school and college years. Meanwhile those who mature later and might end up as superior performers lose interest because of lack of opportunity.

Physical Unfitness.—In many areas of education, the gifted child has been neglected. But in physical education including athletics this is certainly not the case. The physically gifted child has usually had the cream of facilities, equipment, and time and attention from personnel. Frequently, this has meant that there has been little or no sports program for other children. At the elementary school level, as a general rule, facilities and personnel are too limited to support both programs. With our crowded schools these conditions are not likely to improve in the near future. Thus, those who are mostly physically fit are likely to receive the major share of attention. Such a program can help to perpetuate physical unfitness among the many children so deprived of opportunity for participation.

What Kind of Program?

Athletic competition needs to be as carefully graded as other parts of the school program. In the early school years (grades 1-3), young children find enough and suitable competition in informal play and their class activities in physical education. As the child grows older (grades 4-6) a desire for further competitive activity shows itself. Boys and girls begin to enter the team game stage and as time goes on will turn more and more to this type of play. An athletic program which includes only a few children of only one sex cannot satisfy this need. What type of program should we recommend? [18]

First, a broad program of class instruction in physical education for all boys and girls is needed. Opportunities to learn skills in a wide variety of games and other activities should be emphasized. This requires definite teaching and not merely the throwing out of balls for unsupervised play.

Second, a varied program of informal play opportunities and intramural sports should be offered for boys and girls in the upper elementary and early junior high school years. In such activities competition is confined to games and contests between teams within an individual school.

Third, occasional invitational games, sports days, and play days involving two or more schools may be arranged. Such activities are limited to neighboring schools or to a small geographical area. The emphasis is on informality without high pressure elements such as championships, tournaments, all-star contests, and the like.

A three-point program like the above makes the best possible distribution of available funds and facilities among all children. It provides satisfying activities for girls as well as boys, for the child with average skills, for the physically gifted, and even for youngsters with handicaps. Such a program spreads the benefits which competitive sports hold for children to all those who wish to take part. It permits the curriculum in competition to grow and develop a pace consistent with the maturity of the child.

Problem Practices

Immature boys and girls are not little men and women; they need a program specifically tailored to their needs. Yet bowl games, all star events, and other activities that tend to force patterns of sports designed for college and professional athletes down into the elementary schools are being pushed in some places. This has led a variety of professional groups interested in the health and welfare of young children to recommend against the following types of procedures and programs: (1) tournaments, frequent contests, long seasons, bowl games, or other procedures that may cause undue pressure or make excessive demands on young boys and girls; (2) games and contests played at night or other times outside usual school or recreational hours; (3) travel beyond the immediate neighborhood or in the case of smaller rural schools to nearby communities; (4) "grooming" of players for high school teams or attempts to make elementary school sports a "farm system" rather than a program for the children themselves; (5) commercial promotions which under various guises seek to exploit youth for selfish purposes; (6) programs which usurp a dispropor-

tionate amount of facilities, funds, and staff time for a selected few rather than for all children; and (7) overemphasis through tournaments, bowl games, "all-star" teams, and other emulations of adult athletics.

Summary

Under good leadership athletics can help to teach moral and spiritual values—to mold character. They can provide wholesome recreation, for both the present and the future. They can help to build organic vigor and improve strength, agility, and endurance. But these values are not an automatic outcome of athletics. They will not accrue unless the sports program is developed with consideration for the physical, mental-emotional, social, and educational principles involved. They cannot be achieved if the sports program includes only a few children and a limited number of activities.

This calls for a reemphasis rather than a deemphasis of athletics. It demands an athletic program that is available to each child attending school so that no boy or girl is denied an opportunity to gain the values of sports participation. Second, it requires medical supervision to make certain that the program will be conducive to the health and safety of each child who participates. Third, it necessitates planned interpretation of that program to the community—to build public understanding of the real purposes and values of athletics in education.

535 N. Dearborn St. (10).

References

1. Rowe, F. A.: Growth Comparisons of Athletes and Non-athletes, Res. Quart. **4**:108-116 (Oct.) 1933.

2. Fait, H.: Analytical Study of Effects of Competitive Athletics upon Junior High School Boys, Thesis, University of Iowa, 1951.

3. McCraw, L. W.: Comparison of Physical Growth and Development of Athletes and Non-athletes at Junior High School Level. University of Texas.

4. Lowman, C. L.: Vulnerable Age, J. Health & Phys. Educ. **18**:635-636 (Nov.) 1947; Relations of Postural States to Competitive Sports, Phys. Educ. vol. 9, Oct., 1953.

5. Hibbert, R. W., Jr.: High School Football Injuries, Rocky Mountain M. J. **47**:276-278 (April) 1950. Joint High School Football Injury Study: Michigan, Minnesota, and Wisconsin, Wisconsin State High School Athletic Association, Marinette, Wis., 1949.

6. Foster, W. K., and Wells, J. C.: Unrecognized Fractures in High School Athletes, Minnesota Med. **31**:1206-1210 (Nov.) 1948.

7. Eichenlaub, J. E.: Injuries to Growing Bones, Today's Health **32**:28-29, 64-65 (May) 1954. Crowe, H. E.: Orthopedic Facts About Football, J. School Health **17**:180 (Sept.) 1947.

8. Hale, C. J.: Physiological Maturity of Little League Baseball Players, Res. Quart. **27**:276-284 (Oct.) 1956.

9. Skubic, E.: Experimental Investigation of Emotional Responses of Boys to Little League and Middle League Competitive Baseball, Res. Quart. **26**:342-351 (Oct.) 1955; Studies of Little League and Middle League Baseball, Res. Quart. **27**:97-110 (March) 1956.

10. Johnson, B. L.: Influence of Pubertal Development on Responses to Motivated Exercise, Res. Quart. **27**:182-193 (May) 1956.

11. Giddings, G. A., cited in Sleep and Children, a report of the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association, 1956.

12. Desirable Athletic Competition for Children, Report of the Joint Committee on Athletic Competition for Children of Elementary and Junior High School Age, Washington, D. C., American Association for Health, Physical Education, and Recreation, 1952.

13. Krogman, W. M.: Child Growth and Football, J. Health & Phys. Educ. **26**:77-79 (Sept.) 1955.

14. Parmalee, A. H.: Fatigue in Relation to Growth and Development, J. Health Educ., vol. 16, Feb., 1953.

15. Reichert, J. L.: Competitive Athletics for Pre-Teen-Age Children: Challenge to Physicians, J. A. M. A. **166**:1701-1707 (April 5) 1958.

16. Report of the Fifth National Conference on Physicians and Schools, A. M. A. Bureau of Health Education, 1955.

17. Knapp, C., and Combes, H.: Elementary Interscholastic Basketball: Does This Produce Superior High School Players? J. Health & Phys. Educ. **24**:12-13 (Nov.) 1953.

18. Report of the National Conference on Physical Education for Children of Elementary School Age, Athletic Institute, Chicago, Jan., 1951.

SPACE FLIGHT.—Scientists and engineers backed by the U. S. Government are headed for outer space. The cost of this campaign will be as astronomical as its objective, but the men who lead it consider its success a national necessity. They point out that the earth's atmosphere is an insignificant film, thinner in proportion than the skin of an apple, and that military technology is about to outgrow it, as it outgrew the earth's surface two world wars ago. Navigation of the air film is no longer enough. No nation will be safe unless it can also navigate the vacuum that hangs overhead. The new status of space flight, formerly made suspect by visionaries and fiction writers, was not defined in public until we recently held our Astronautics Symposium at San Diego. Planned as a small "confab" of space-minded missile men, this conference ballooned into a crammed mass meeting of engineers and scientists representing airplane, electronic, and instrument companies, as well as universities and all three armed services. A few years ago most of these hardheaded men would not have attended a space-flight meeting except incognito. Now we are eager.—Capt. W. M. Snowden, M. C., U. S. N., Newer Concepts in Aviation Medicine, *A. M. A. Archives of Industrial Health*, September, 1958.

COMPETITIVE ATHLETICS FOR CHILDREN

Jean Hoxie, Hamtramck, Mich.

Competition in athletics for children can serve as a positive force if every child learns to take losses as well as victories. Competition among children should not follow the intercollegiate pattern of worshiping the star performer and neglecting the unskilled. It should, instead, be kept within such bounds as to promote both the growth of the child's body and the development of a personality.

We all agree that the three things a growing child needs most are food, sleep, and exercise. Parents stress the first two and overlook the last. Allowing the matter of exercise to take its own course is not too bad, since the child's interest to use his body is so strong. But a young one does need guidance in the amount and kind of exercise he takes and a constant check on his inclination to overtax himself.

The "Golden Rule"

We will assume that every competent, successful coach is familiar with and able to impart the basic fundamentals of his or her effort, so let us pass on to some of the things common to all sports. One of the things I, myself, consider more important than whether Johnnie can break 70 in golf, win tennis matches 6-0, or even be a star in touch football or track, is sportsmanship. Sportsmanship is, after all, only an application of the "golden rule."

One of our authorities on child development said, "All young children are poor sports; an average child takes about 15 years to develop to the point where he can conform to adult standards of good sportsmanship. When children are poor sports they do not have warped personalities; they are not potential criminals; they are just downright spoiled; they are children behaving like children."

A child who is a poor sport can hardly grow up to be a good citizen. Let's face it: good sportsmanship begins at home. If mother pouts at the bridge table or father burns after a missed putt, children think it is accepted behavior.

Children, whether players or spectators, also take their cues from their coaches. An undignified, ill-tempered coach who curses, boos, jumps up and down, protestingly storms out onto the floor, or throws up his hands after losing a game or point is hardly setting an admirable example. A wiser coach or parent recognizes achievement and applauds good play of both teams.

Give your children time to develop. When they make a mistake, talk it over with them. Encourage them to play with their contemporaries. Children learn sportsmanship from playing with other children. You will be surprised just how much they learn and how fast. It is better when they are all about the same age and size; then, no one child can dominate the others. Everyone faces the fact of winning and losing.

Director of Tennis, Hamtramck Public Schools.

Read in the Symposium on Competitive Athletics in Children before the Joint Meeting of the Section on Pediatrics and the Section on Preventive Medicine at the 107th Annual Meeting of the American Medical Association, San Francisco, June 26, 1958.

Success and Failure

Another thing we must consider is failure. Don't be too quick to decide that some child has failed to learn some particular physical skill. Give him plenty of time and some extra coaching on the side. Never ridicule his awkward early efforts. Usually failure to master some desirable skill, such as being able to catch a ball, hit a drive, or make a short putt, is caused by a lack of opportunity to practice or by self-consciousness.

Too much striving? Don't let the child push himself past his own capabilities. Keep him competing with those of his own age level. Do not let the child become overtired. This fatigue could be caused by inadequate food, lack of sleep, overexercise, emotional frustration, or all four together.

We cannot have a successful sports program without competition—but perhaps not the kind of competition we have on the intercollegiate pattern of men's sports, with its ballyhoo, its insane and inane worship of star performers, its attention to the skilled and neglect of the unskilled, and its sporting followers who demand victory at all costs.

The prime objective for any person, child or adult, is mastery of the game within the limits of his capabilities. In addition, the tremendous sense of achievement that comes from doing something well may be an aid to successful personality development in the child. The habits of diligence and perseverance necessary to achieve mastery and also to retain mastery of a sport should serve the child both in the athletic situation and also in other situations which the child might meet.

Competition, if not viewed as the prime goal but rather as an additional goal, may serve in a positive manner. It is not desirable to let the child stay in an "ivory tower," where his supremacy is never threatened. On the other hand, great care must be exercised that the child is not put in a situation where defeat is inevitable and to which he can react only with despair and withdrawal. Where a child has a reasonable chance for victory and when

he is aware that mastery of the game is his prime goal, competitive athletics then serve as a positive force, for every child must learn to take losses as well as victories.

In the last analysis, it is the coach who senses his pupil's needs and limits, who is able to make competitive athletics a positive force for growth and personality development in his students.

IMPLICATIONS OF LONGITUDINAL RESEARCH IN FITNESS PROGRAMS

Robert W. McCammon, M.D.
and
Alan W. Sexton, Ph.D., Denver

The desire of each generation of parents to have its children grow up to be the sort of superb physical specimens that the parents would themselves like to have been is as old as civilization. The means most frequently chosen to attain this end has been some form of athletic participation. The selection of this means seems to rest equally on our concept that the athlete personifies physical vigor and on the practical consideration that it is easier to gain the cooperation of children in games and sports than in other forms of activity.

War has always been the most potent stimulus toward seeking greater fitness in the population, though the industrial revolution, with its example of physical degradation incident to urbanization and coupled with long working hours under miserable conditions, also served to intensify the cries for a "sound mind in a sound body," across the European world. Between periods of crisis such as these, the distaste with which the usual parent approaching middle age views his diminishing physical equipment suffices to make him vow that his children will never come to this but will develop all the physical attributes the parent either never had or will never have again.

In our day, with the span of useful adult years increasing rapidly, the descriptions of the decaying state of our youths' fitness are not in any real sense different from the descriptions voiced during the reign of England's first Queen Elizabeth. Again, it is children at whom the programs are primarily aimed, with at least 10 admonitions to slow down activities and avoid physical stress after the age of 30 for each lonely voice raised to advocate two-mile runs before breakfast daily for those of 50, bicycling to the office at the age of 60, or parachuting into rivers for octogenarians. Still, there have always been critics of those who stress conditioning of children.

From the Child Research Council, University of Colorado School of Medicine.

Read in the Symposium on Competitive Athletics in Children before the Joint Meeting of the Section on Pediatrics and the Section on Preventive Medicine at the 107th Annual Meeting of the American Medical Association, San Francisco, June 26, 1958.

Fitness at best is a vague concept which can only be defined in terms of the purpose for which the individual desires to be fit. Fitness at a given moment may fail to reflect or predict fitness as briefly as six months from the testing. Fitness at the time of testing may vary remarkably, dependent on the standard of measurement used. The response to conditioning programs, such as athletic participation, is a highly individual thing rather than a group or age phenomenon. Children and young adults who show no frank disease are generally and similarly fit. The expectation is unrealistic that any conditioning program applied to a general population of any age level will produce uniform response.

Aristotle said in his "Politics," "Of those states which in our own day seem to take the greatest care of children, some aim at producing in them an athletic habit, but they only injure their forms and stunt their growth. . . . The evil of excessive training in early years is strikingly proved by the example of Olympic victors; for not more than two or three of them have gained a prize both as boys and as men; their early training and severe exercises exhausted their constitutions. When boyhood is over, three years should be spent in other studies; the period of life which follows may then be devoted to hard exercise and strict diet."

It is not our purpose to join forces on either side of this argument. We simply wish to present data on various forms of fitness testing which we feel are adequate to support the statements that fitness at best is a vague concept which can only be defined in terms of the purpose for which the individual desires to be fit, that fitness at a given moment may fail to reflect or predict fitness as briefly as six

months from the testing, and that fitness at the time of testing may vary remarkably dependent on the standard of measurement employed.

Methods of Study at Child Research Council

The Child Research Council has been engaged for the past 28 years in a form of investigation involving repeated examinations of the same group of individuals at intervals during their entire life spans. The childhood period is interesting and important, but it seems reasonable to suppose that much of its interest and importance is derived from its impact on the events to come in the much longer span of maturity and senility. We feel that one of the major deficiencies in our knowledge of human biology is the lack of serial investigations on man which would not only permit us to know what happens throughout childhood but also give us an opportunity to trace the influences of these childhood events insofar as possible in the mature person. With regard to the present discussion, for example, we hope to be able to say in the years to come whether, as an adult, the child who was athletic and apparently fit before and during adolescence is more or less fit and longer or shorter lived than his contemporary whose measurable fitness was less outstanding in his growing years and whose participation in athletics consisted of ownership of season tickets to all the athletic events. To this end we have been administering bicycle ergometer tests to our subjects for the past 18 years, and we have added other forms of testing within the limits of our situation as the tests became available and attained acceptance. The ones in charge of this discussion very kindly granted us permission to present data for the entire span of years we have covered in this program rather than limiting us to the age of 12 years.

The study series of the Child Research Council is composed of children born in middle and upper middle class Caucasian families in Denver. Because of this selection, any limitation of nutritional, educational, athletic, or other opportunities is largely the result of individual choice rather than environmental pressures.

The presentation of data representing the performance of single individuals, where only a very few can be crowded in to the space available, is always subject to the danger of selection on the basis of proving a point with a series of three or four cases. We were somewhat protected in this instance because of the orientation of this discussion. In accordance with that orientation, we divided our children into three groups: (*a*) those who have participated in team sports where they have been subjected to organized programs designed to increase their physical fitness with an eye to competing with other teams; (*b*) those who have been more individual in their activities and whose conditioning depends practically entirely on their own initiative and energy; and (*c*) those who have never wilfully participated in athletics and have taken part in compulsory physical education in school only under protest. From these we then selected the three individuals in each category for whom we had the longest and most nearly complete follow-up records. The grouping of individuals in the figures was done with deliberate bias, which will be explained separately for each figure.

The material presented in the figures represents the results of four tests performed periodically on the subjects of the Child Research Council. The central line graph gives the range of scores by sex for the

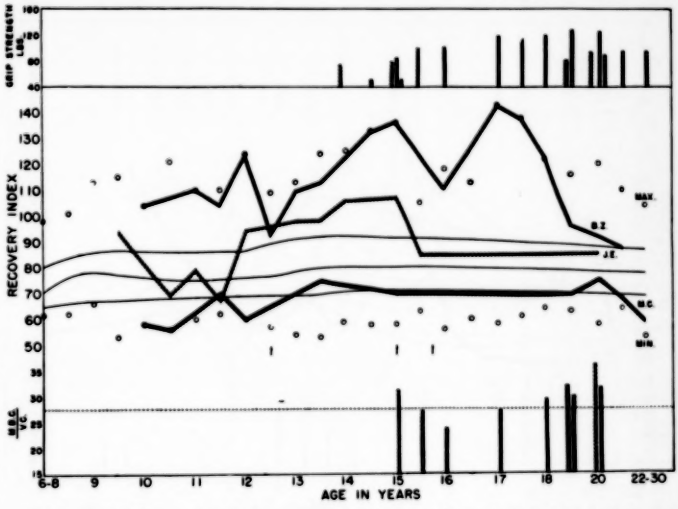


Fig. 1.—Physical fitness values for team athletes (solid line), individual athlete (striped line), and nonathlete (line of circles).

pulse recovery index, as calculated by the formula of the Harvard Fatigue Laboratory, after four minutes of exercise on the bicycle ergometer with the friction load adjusted in such fashion that the subject does ±5% of the same amount of work that he would have done on a standard step test. The circles above and below the central lines represent the maximum and minimum scores recorded for each age. The things which have interested us about these data are the relatively narrow range of distribution for the middle 50% of the group, the marked skewing of the data upward as compared with the minimal spread below the 25%, and the flat nature of the curve. Apparently, whatever the faults of this measurement, it does successfully eliminate differences due to increases in musculature and maturity.

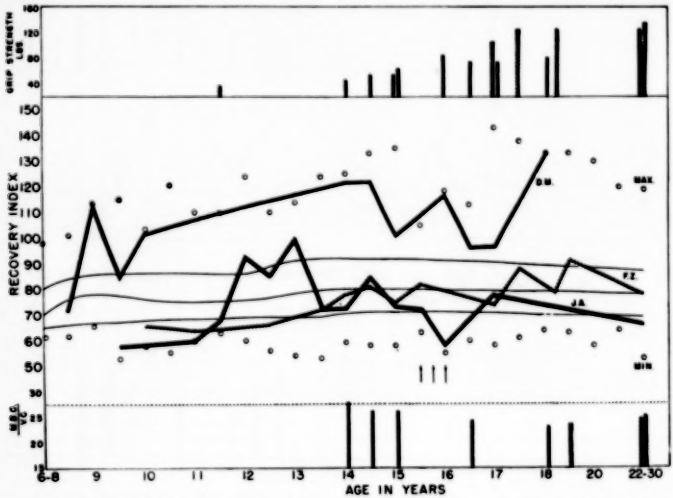


Fig. 2.—Physical fitness values, showing consistency of scores in three categories of activity for team athlete, individual athlete, and nonathlete.

The upper bar graphs give the grip strengths of the children represented. We have insufficient data at this time to establish meaningful standards for our group, but at least this permits us to compare one measure of muscle strength within these children.

The lower bar graphs represent a rather complex respiratory ratio, derived by dividing the maximum breathing capacity per square meter per minute by the vital capacity per square meter. It should be pointed out that this permits a child to show a high score either by having a relatively high maximum breathing capacity or by having a relatively low vital capacity. We have used this ratio in an attempt to express respiratory efficiency within the individual. It has the characteristic of dropping rather remarkably in a child who adds fat to the point of frank obesity. At this time we make no claims for it except to say that it seems to fit no better and no worse with our general appraisal of the subjects than the other tests used. The dotted line simply indicates the middle of the range we encounter in our subjects to give some idea of the situation of these children compared with the total group in the absence of enough data to make standards meaningful.

The small arrows indicate the age of maximum growth in height during adolescence for each of the children presented, both to give an idea of the developmental status of the subjects at any given point on the age scale and to illustrate how smoothly Aristotle avoided a difficult problem when he disposed of the whole subject of variation in the age of physical maturation by saying simply "when boyhood is over." Extreme as the differences represented here are, with the earliest peak of adolescent growth at 12 years and six months and the latest peak at 15 years and nine months, they do not represent the extremes found even in our relatively small group of less than 100 boys. The median age for maximum adolescent growth in boys for our series is 14 years, which suggests that considering childhood as terminated after the age of 12 is not only arbitrary but also erroneous.

Comparative Results

The three children grouped in figure 1 were placed together to show that, with proper selection, it is possible to fit all or most of the common concepts regarding the superior scores of the conditioned athlete no matter what type of measurement is used. The boy represented by the solid black lines was active in many sports, both as a member of his school teams and in the various "little leagues." He represents the maximum recovery index at more ages than any other child on the series. It is also true that he shows another facet of expected response, in that he stopped being active in any athletics except skiing when he finished his freshman year in college and since then has shown an abrupt drop in his score. The boy represented by the diagonally striped lines is the individual athlete,

being active in swimming, skiing, tennis, and mountaineering. Although somewhat limited by going to college, he has still managed to remain active and his scores have remained fairly constant. The boy represented by the line of circles is one of the "contentedly unfit," who has successfully avoided participation in athletics and other physical activity. The fact that he had moderate asthma throughout childhood, which cleared when he was about 15 years old, may have accounted for some of his distaste for physical activity, but since he has been free from symptoms his scores have not improved.

The grip strengths of these three boys tell the same story. The conditioned athlete is clearly stronger than either of the others, and he maintains this superiority and continues to show some increase even after his recovery score has dropped. The individual athlete, while not able to match the organized athlete except briefly when he had completed his adolescence and the team athlete was just entering his, still has no trouble in staying ahead of the nonathlete in muscle strength.

In the respiratory ratio graph, however, the conditioned athlete falls behind both of the others and the individual athlete is superior. It is interesting that the nonathlete, in spite of his asthma, manages to attain a very good score, but it should be recalled that this is a ratio between two respiratory measurements and his score is aided by his relatively low vital capacity.

Finally, the early-maturing boy in this group is not the one who is athletically inclined in the usual sense, and the two extremes in athletic participation and fitness measurements are really much closer to each other in age of maturation than either is to the early-maturing boy.

In figure 2 the symbols represent the same categories as in figure 1. Again, the team athlete outstrips the other two, but this man failed to show any drop in his scores after the age of 16 when he practically stopped his participation in athletics in favor of working on his hot rod. In muscle strength, however, he is clearly below the other two boys and is actually below the median for boys of our study series. There is much less differentiation between the recovery scores of the individual athlete and the nonathlete than we saw in the first group of three. At one point, the nonathlete became athletic. Because of his late adolescence he was still preadolescent when he entered high school, and he was so anxious to demonstrate his masculinity that he went out for and made the beginning football team, in competition with boys much more advanced in maturation than he was. The score at 15 years and six months was obtained shortly after the close of the football season that year, and the dip at 16 coincided with his dropping out of football because he no longer felt the urge to prove he was a man after he had physical evidence of it.

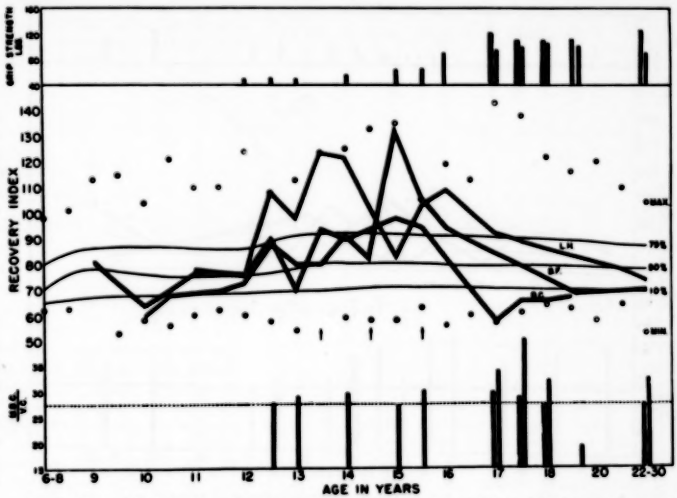


Fig. 3.—Physical fitness values, showing similarity of scores in team athlete, individual athlete, and nonathlete, engaging in three categories of activity.

The individual athlete in this group, while one of the largest boys in our group, took only a desultory interest in the organized athletic programs available to him, never went out for any school team, and preferred to spend his time and energy fishing and hiking, activities which he maintained through two years of military service and now continues as a civilian. After a slow start, his recovery index has shown a steady rise and is now in the upper half of the group. His muscle strength, as might be expected from his large size, is well up in the group, though not superior to that of the nonathlete in any significant degree. As adults, the respiratory ratios of the three subjects are quite similar, which is interesting in view of their markedly different physical builds and diverse past experiences in physical conditioning. They are also very similar in the age at which they attained the maximum rate of adoles-

cent growth, being grouped in a six months' period starting 18 months later than the median for the boys of our series.

In figure 3, also, the solid line represents the team athlete, the diagonal stripe the individual athlete, and the small joined circles the nonathlete. If we consider the over-all picture, these three boys are not very different from each other in their scores on the bicycle. If there is a long-term edge held by any of them, it would have to go to the individual athlete, who was a runner because he liked to run in much the same fashion as Europeans run for exercise. In high school and in college he ran the mile in track, but in our area there is no competitive track activity before high school and he ran as much and as well before high school as he did afterward.

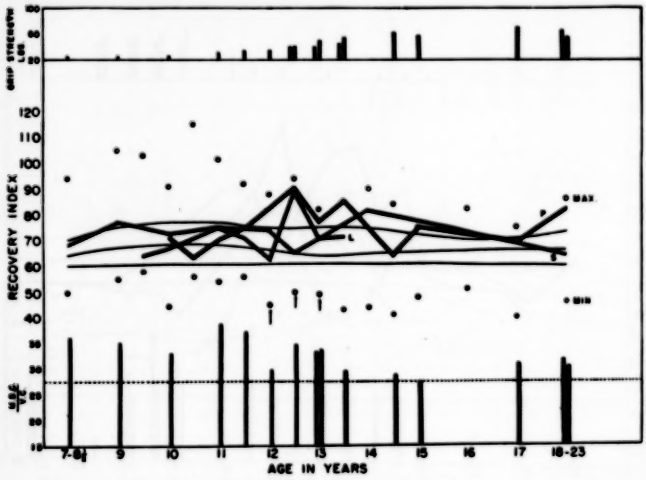


Fig. 4.—Physical fitness values in three sisters, showing similarity of scores.

The nonathlete is the brother of the nonathlete on the first chart, and, while he had no asthma, he showed the same disinclination to involve himself in athletics as his brother did. In spite of this, his scores in the early years compare well with those of the other two in all parts of the testing. At 15 years of age, he was sent to a private school where athletic participation was compulsory as a daily portion of the school curriculum, and then he went to a military school, which he still attends, where physical conditioning is part of a way of life. If these experiences have changed his physical condition, the reflections of the change in the physically stressful bicycle test are clearly for the worse, and it is only in the respiratory index that he has shown any visible improvement.

The team athlete in this group is perhaps the most interesting child and young man to be presented. From his early school days to the end of high school, athletics and physical conditioning were almost a religion to him. In spite of his ordinary muscular strength, his median age of adolescence, and his small physical size of 130 lb. (59 kg.) on a 5-ft., 8-in. (172.7-cm.) frame, he is the most accomplished athlete of our group, at least in the sense of recognition of his accomplishment. He was all-conference selection in football, basketball, and baseball each of his last two years in a tough city league, and in basketball he was repeatedly chosen by the local sports writers as the high school athlete of the week. Yet, except for the peak just after his maximum growth period and just before he entered high school, his scores on the bicycle have been ordinary enough and the decline which started during the years of intensive training was not increased in slope when he stopped athletics as a busy college student earning much of his way as a shoe salesman. Now, as a truly physically decadent medical student of 23 years, his score precisely matches his scores of 10 and 11 years when his life was filled with athletics instead of prescriptions and diagnoses.

Figure 4 was assembled to show that we do not neglect the girls. It is difficult to match the categories we set up for the boys, so we selected three sisters, one of whom may be termed athletic during the past two years since she took a serious interest in ballet. The other two have never been athletically inclined. Except for the graphic symbols, which still present the "athlete" as the solid line, it would be impossible from any of the tests to separate these girls. The established lesser muscle strength of girls is well illustrated by the grip strength results. The respiratory scores of the girls, however, are well above those shown by any of the boys. We have laughingly passed this off as expected, since everyone knows women are windier than men. But if we take a look at census or actuarial figures on the sex of those who live the longest the laugh becomes less fun.

In keeping with the general trend of those who concern themselves with fitness to make sweeping statements on limited data, we would like to point out that these three sisters raise the possibility that what we measure and term fitness is as much on a familial basis as on an environmental basis. At least

so far as the bicycle ergometer scores are concerned, other siblings show the same close grouping in general as these girls show, whether they are of one sex or both. With the exception of the nonathletic brothers previously shown and one other family, the results obtained on siblings could be transferred from one child to another within a family without dislocation of the trend of any child. We do not present this as establishing a hereditary element in fitness, nor could such an element be established on a group such as ours. We do want to emphasize that the basic material which is being worked on must be taken into account along with the manner in which it is processed in the production of superior physical fitness as in the production of any other commodity.

Summary

The data collected by the Child Research Council support the point of view that children and young adults who show no frank disease are generally and similarly fit. The response to conditioning programs, such as athletic participation, is a highly individual thing rather than a group or age phenomenon, so that the expectation is unrealistic that any conditioning program applied to a general population of any age level will produce uniform response. Various measurements of fitness and response to conditioning, when applied to the same individual, give different answers, suggesting that current testing methods omit consideration of the question, "fitness for what?" There is as yet no evidence that athletics or other forms of physical activity produce any measurable or lasting benefits when applied only to children, and such adult work as is available indicates that, to be of value, the activities must continue through the major portion of the life span of the individual.

4200 E. Ninth Ave. (Dr. McCammon).

SUBDURAL HEMATOMA IN THE ELDERLY PERSON

Peter Stuteville, M.D.
and
Keasley Welch, M.D., Denver

Subdural hematoma may occur at any age, and its manifestations depend on the age of its victim. The particular characteristics of the disorder at the earliest extreme of life have received wide attention, while its features at the other extreme have not. It has, however, been realized that in elderly patients subdural hematoma may mimic vascular disease or senile degeneration of the brain and that this diagnosis may be extremely difficult.[1] Moreover, the results of treatment have been poor. For these reasons, a study of the problem was undertaken in the hope that the clinical features of the disorder might be clarified and earlier recognition and treatment might thus be permitted.

Analyses [2] of large series of patients of various ages with subdural hematoma has drawn attention to the fact that the only consistent historical incident is one of trauma to the head. These studies and others [3] emphasize the variability of clinical manifestations that may appear and the unreliability of particular physical signs as a basis for diagnosis, in any age group. It is worth noting that in these extensive series patients over the age of 65 years make up only a small portion of the total numbers.

From the Division of Neurosurgery, University of Colorado Medical Center.

Read before the Section on Nervous and Mental Diseases at the 107th Annual Meeting of the American Medical Association, San Francisco, June 26, 1958.

The course of subdural hematoma was studied by reviewing the hospital records of 75 patients, 65 years of age or older, in whom the condition was demonstrated either at operation or at autopsy. The symptoms were such that the condition might easily have been mistaken for senile degeneration of the brain, cerebral vascular disease, or other conditions. Of the 30 patients who underwent operation, 17 survived and improved, while the typical course observed in 45 patients who did not undergo operation was a quiet, gradual decline, frequently terminated by sudden and unexpected death. The importance of early diagnosis and prompt operation was demonstrated. Although subdural hematoma in the elderly patient is a subtle disease, frequently disguised, it may be possible to increase the accuracy of diagnosis by keeping this condition in mind, diligently utilizing such diagnostic means as angiography, and resorting more readily to surgical exploration.

This study is based on a review of hospital records of 75 patients 65 years of age or older who had proved subdural accumulations sufficient to cause mental disability, physical disability, or death. The patients whose records were examined comprised all in this age group in whom the lesion was confirmed either by surgical exploration or by autopsy during the past 15 years at Colorado General Hospital, Denver General Hospital, and the Denver Veterans Administration Hospital.

Analysis of Cases

Age, Sex, and Race Distribution.—By far the largest number of patients (78%) were white males; only 18% of the patients were white females; and 4% were Negroes. The 75 cases studied were made up of patients between the ages of 65 and 92 years. Of these, there were 28 (37%) aged 65 to 69, 15 (20%) aged 70 to 74, 16 (21%) aged 75 to 79, 11 (15%) aged 80 to 84, 3 (4%) aged 85 to 89, and 2 (3%) aged 90 to 92.

Chief Complaints.—Escorting relatives or friends were, not infrequently, the sources from which examiners drew the reasons for a patient's delivery to the hospital emergency room or admitting ward. Often, the reasons stated seemed to represent inferences rather than quotations of complaints previously made by the patient himself.

Of these 75 patients, 32% (24) were brought into the hospital because they had suffered some kind of injury; 16% (12) because they had shown signs of mental or personality changes; 13% (10) because they were unconscious and could not be awakened; 11% (8) because of constant and severe headaches; and 4% (3) because of a neurological disability such as a hemiplegia. Twenty-four per cent (18) sought admission for medical or surgical diseases of other systems.

Trauma.—In the present series, 4% of patients entered the hospital comatose and without accompanying history of any kind. For the most part, these patients were old men who lived alone in rooming houses, where they had been found unconscious by acquaintances. A history of trauma was elicited in 71% of the cases; 31% of the patients had suffered overt trauma, as from road accidents or assault. The remainder simply had a history of falling. Four patients, resident in the hospital for nonneurological conditions, were injured on the wards, either by falling out of bed or by striking an open door during the night. In slightly less than one-fourth of all the cases, no history of trauma could be unearthed. A similar proportion of all the patients fairly certainly had been drinking at the time when the illness began.

Physical Findings.—Physical signs of increased intracranial pressure rarely were encountered. Of the patients studied, only 12 could be said to have been awake, alert, and mentally intact at the time when they were first examined; of these, 4 were injured later on the wards. The remaining patients were confused, demented, stuporous, or comatose.

Bruising about the head was remarkably frequent, being noted in over one-half of the patients. Focal neurological signs were of course, common, but since many of the patients were not examined with neurological disturbances in mind, only a rough estimate can be made about their actual frequency. Common physical findings in the patients were an alterated state of consciousness in 63 (84%) (confusion in 15 [20%], stupor in 22 [29%], and coma in 26 [35%]), bruises on the head in 44 (59%), mild arterial hypertension in 17 (23%), pupillary abnormalities in 29 (39%), speech difficulties in 11 (15%), bilateral extensor toe signs in 13 (17%), hemiparesis in 18 (24%), and evidence of alcoholism in 19 (25%).

Admitting Procedures.—As might be expected, the majority of patients with obvious head injuries were admitted to the neurosurgical service; 27% of all patients went initially to that service. Another 11%, chiefly those with clear-cut, but apparently nontraumatic, neurological disease went to the neurological service. Two patients went to the psychiatric service because of their dementia. Thirteen per cent went to a surgical or to a surgical subspecialty service with complaints or signs of such things as urinary retention, fracture, bowel obstruction, and the like. Almost half of the entire series was first admitted by the medical service. Of this number, 25% were accepted because of a history or signs of nonneurological disease such as disorders of the lungs and heart. The rest were deemed to be suffering from vascular accidents of the brain. The diagnosis on admission was subdural hematoma in 8 (11%), head injury in 19 (25%), neurological disease in 26 (35%), medical disease in 9 (12%), psychiatric disease in 3 (4%), and surgical disease in 10 (13%).

Hospital Course.—Failure to improve followed, at times, by a quiet and gradual decline and, at other times, by sudden and unexpected death seems to have been the pattern in those patients who did not come to operation. Thirty of 75 patients were said to have died suddenly or unexpectedly.

Cerebrospinal Fluid.—The cerebrospinal fluid pressure was completely normal in almost three-fourths of the 42 tests performed. Fluids altogether normal in appearance and cellular content were obtained in 40% of specimens while the remainder were xanthochromic or bloody. The protein content was analyzed in only 20 of the 42 specimens, and in 9 patients the protein level was within normal

limits. Sudden death followed in one instance of cisternal puncture and in two instances of lumbar puncture.

X-rays of the Skull.—Over half the patients studied had no x-ray of the skull made at any time during their hospital stay. Of the x-rays of the skull that were obtained, one-third showed a fracture line and one-fifth definite displacement of a calcified pineal.

Operative Results.—Explorations were carried out in 30 cases. Although some 42 patients were suspected, on clinical grounds, of harboring a clot, 12 failed to reach surgery, because, in almost every instance, the patient had deteriorated beyond the point where neurosurgical intervention could be begun or completed before his death.

Of the 30 patients operated on, 57% survived the operation to improve, while the remainder died postoperatively. In half the postoperative deaths, failure to respond resulted from a reaccumulation of the clot; in the other half, such pathology as massive cerebral edema and intracerebral hematomas was found at autopsy. Contrasted to the over-all figures are the figures in the 20 most recent cases, in which 19 patients were given a diagnosis and operated on and 11 survived.

Report of Cases

Taken alone, statistical analysis of the data drawn from this inquiry is not enough to afford satisfying insight into the clinical features of subdural hematoma in the elderly patient. Simultaneous study of individual case histories is essential if the essence of the malady is to be understood.

The first case report exemplifies the commonly encountered situation in which an old man is brought to the admitting ward by relatives or friends who have noticed recently that something has been wrong with him. The patient, approached by a physician and questioned about his troubles, is likely to be grossly confused and totally unaware of the reason for his family's concern. Consequently, he tends to draw attention to such irregularities of function as his cough or his difficulty in passing urine. Duly noted, this complaint is pursued while the confusion or dementia is attributed to senility.

Case 1.—The patient was a 66-year-old man who was brought to the emergency room by his family. When questioned, he complained of frequency and urgency of some two to three years' duration. He was examined and was found to have a large prostate gland, to be confused, and to have a minimal right-sided hemiparesis with appropriate reflex changes. He was admitted to the urologic service, where cystoscopy was done and a lumbar puncture was made. On his eighth hospital day, he died suddenly and unexpectedly. Postmortem examination revealed a large, left, subdural hematoma and a massive pulmonary embolus.

Not infrequently, cerebral vascular disease seems to be a reasonably acceptable basis to account for the patient's presenting difficulties.

Case 2.—The patient was a 92-year-old man who was brought to the hospital unconscious. Ten years earlier, he had had a "stroke" that had left him mildly hemiparetic on the right side. Three days before admission, he was said to have had another "stroke." There was no history of trauma to the head. After the second attack, he went through intermittent periods of unconsciousness which gradually grew longer and more frequent until he could not be aroused. He had been noted to be somewhat weaker than usual on his right side. Examination at the hospital showed him to be profoundly comatose, to have a right-sided hemiplegia with absent tendon reflexes on that side, and to have a right extensor plantar response. He was brought into the hospital and treated supportively. He failed to improve over the next four days and finally died of extensive, bilateral, subdural hematomas.

The following case points up the fact that the early complaints of many patients of this age with subdural hematoma may be nonspecific.

Case 3.—The patient was a 76-year-old man who had been in good health until 10 days before the time when he appeared at the hospital. At the onset of his illness, he was said to have had the "flu," and he was treated for this by his family physician. During the course of treatment, however, the patient appeared to be "dull," and he complained often and bitterly of severe and constant headache. Finally, he became somnolent, and, at this point, he was referred to the hospital. Examination showed him to be in and out of stupor and to exhibit a left-sided hemiparesis with generally symmetrical but hyperactive deep-tendon reflexes and with bilateral extensor plantar responses. Lumbar puncture yielded conspicuously xanthochromic fluid under a pressure of 300 mm. of cerebrospinal fluid. Cerebral arteriography disclosed the presence of a subdural hematoma on the right side. Evacuation of the hematoma was followed by recovery.

Reminiscent of the situation often seen at the other extreme of life is a simple failure to thrive, physically and mentally, because of a subdural hematoma.

Case 4.—The patient was a 78-year-old man who had been sent to a nursing home by his family because of near starvation and from the nursing home to the hospital because of progressive deterioration in his nutritional state. At the time of admission, the patient was cachectic, lethargic, and irritable, but he displayed no focal neurological disturbance. In the hospital, he was investigated thoroughly, but no specific reason for his decline could be established. Throughout his 11 weeks in the hospital, and despite vigorous and conscientious medical management, he failed to improve. Finally he became even less responsive, developed cyclic breathing, and shortly thereafter died. Postmortem examination showed bilateral chronic subdural hematomas and pulmonary infarction.

Comment

Clinical Features.—The present study was undertaken with the hope of clarifying the clinical features of subdural hematomas in elderly persons and thereby making it possible to distinguish the disease from others producing similar manifestations. Unfortunately, this objective was not wholly attained, since elderly patients with this malady proved not to present consistently characteristic pictures. None

the less, it has been possible to define a variety of clinical situations sometimes associated with this disease.

The first such situation is one in which there is a definite initiating injury, as from a serious fall, automobile accident, or an assault. The patient tends not to improve but may do so slowly and incompletely. He may remain or become confused, demented, or somnolent and develop signs of neurological deficit. In such cases, a surgical lesion can be usually diagnosed with relative ease, and surgical exploration or angiographic study can be used with but slight hesitation. There are, however, patients in whom the clinical course, even after a definite initiating injury, has so much of the flavor of cerebral vascular disease that the suspicion of subdural hemorrhage is not entertained.

A second situation (and it is the one which involved the majority of our patients) is one in which a history of trauma is sometimes not elicited or is denied. If remembered, injury has been considered to be trivial, and one or several minor falls have been interpreted as symptoms rather than causes of the patient's illness. The patient, often too confused to give a reliable history, is frequently sufficiently well enough preserved to give a misleading one. Under such circumstances, he may be admitted to almost any service in the hospital for treatment of his accepted senility plus his "stroke," his pulmonary disease, his heart failure, or other obvious physical disability. Later in his hospital course, he declines more or less markedly and rapidly to become somnolent or comatose. Carefully examined, he usually will be found to have bruises of the scalp, sometimes indistinct and fading, often concealed beneath the hair. Although by no means constant findings, there may be such neurological abnormalities as a hemiparesis with single or double extensor toe signs.

Guillaume and Œconomas,[14] describing their observations of patients of this category, state that ordinarily they exhibit asthenia, headache (constant or varying with postural changes), diminished intellectual activity, loss of initiative and of memory, and poverty of ideation. More recently, Bedford [15] has made the following observation:

> Typically the history is that the old person, already somewhat enfeebled, has recently become mentally confused: medical advice or admission to hospital is sought for this latter symptom. A history of a fall within the preceding weeks or months may be elicted—usually by direct questioning—and has been attributed to "old age" or to a "little stroke." The fall may have been accompanied by transient unconsciousness or epileptiform jactitations (and it may be observed here that although a fit is only rarely a symptom of subdural hematoma, it is by no means a rare cause of the fall which leads to the blow on the head—trivial or otherwise—which is its almost invariable antecedent). Physical examination only rarely contributes substantially to the diagnosis. The usual clinical picture is that of a mentally confused old person with some impairment of intellectual capacity (which may be slight, moderate, or profound), who may be somewhat or deeply drowsy—but is as often not—and who may or may not have bruising about the eyes and forehead; there is often evidence of damage to the pyramidal systems, and occasionally pupillary abnormalities not unjustifiably attributable to ocular disease, which also hinders adequate retinoscopy. Very often, too concomitant disease of other systems—a fractured neck of femur, bronchopneumonia, heart failure, or uremia—provides further diagnostic distraction.

Less commonplace clinical situations are exemplified by the case reports of patients who simply failed to thrive, mentally and physically, or who complained early of insistent and severe headaches but showed no physical signs.

Diagnosis.—Bedford [15] pointed out the difficulty and complexity of diagnosis by noting that fully 80% of 5,000 elderly people admitted to the Oxford Geriatric Unit over an eight-year period were confused—no matter what the diagnosis. His experience with x-rays of the skull and with lumbar puncture resembles ours. Similarly, his diagnostic accuracy approximates our own. In this regard he says: "Indeed, despite the utmost vigilance, only 40% of my elderly cases were diagnosed in life. . . ."

On the other hand, we fail to share the misgivings reflected in his statement that: "It must reluctantly be admitted, therefore, regarding the diagnosis of subdural hematoma in the aged, that unless thousands of old people are to be submitted needlessly to an unjustifiable intracranial exploration, every physician concerned in their care will see a number of patients each year in whom the condition unavoidably defies detection, and this unsatisfactory state of affairs is not materially improved by the knowledge that even without surgery, these effusions are not invariably lethal." Our point of view on this score is based on the fact that of our 20 most recent cases, 19 were recognized in life, admittedly while a certain number of fruitless (but by no means unjustifiable) diagnostic procedures were made in patients without such disease.

Finally, it seems prudent to stress the importance of early diagnosis, if diagnosis is to be made in a living patient and if treatment is to be effectual. Time and again we have encountered instances of sudden and unexpected death caused by subdural collections. Furthermore, the beneficial diagnoses were made early, and treatment too long delayed commonly failed.

Frequency.—From our data, we cannot estimate the actual incidence of subdural hematomas in the aged. Bedford,[15] however, found the disease in 1% of a rather large group of hospitalized patients over 65 years of age.

Treatment.—Our own proportion of unfavorable results of treatment makes us hesitant to defend any particular method of management. In our cases, liquid clots were drained between bur-holes, and the occasional solid clot required a larger bony opening for its removal. During the past two or three years, we have made it a matter of policy to reoperate on any patient who declined anew after surgery or who failed to rally as expected. In certain instances we have reoperated as many as four times to be gratified, eventually, by the patient's recovery. Our experience with LaLonde's and Gardner's [4] method of spinal injection of saline solution is not extensive enough to allow us to form an opinion about its merits. From the limited use that we have made of this maneuver, we are certain, however, that it does not always make subsequent operations unnecessary.

Summary

In the elderly person, subdural hematoma is a subtle disease frequently disguised so that it may be taken for senile degeneration of the brain, cerebral vascular disease, or other conditions. Although early diagnosis is difficult, it is essential; first, because the clinical course of a patient with a subdural hematoma frequently is terminated abruptly by sudden and unexpected death and, second, because treatment too long delayed often fails.

Despite the lack of an easy solution to this problem, our experience suggests that it may be possible to improve this difficult state of affairs by cultivating an attitude of suspicion and by readily resorting to angiography or exploration in the older patient when the diagnosis can reasonably be entertained.

References

1. (*a*) Guillaume, J., and Œconomos, D.: Collapsus cérébral et hématomes sous-duraux, Rev. neurol. **84**:185-187 (Feb.) 1951.

(*b*) Bedford, P. D.: Discussion: Intracranial Haemorrhage—Diagnosis and Treatment, Proc. Roy. Soc. Med. **51**:209-213 (March) 1958.

2. Gardner, W. J.: Traumatic Subdural Hematoma, with Particular Reference to Latent Interval, Arch. Neurol. & Psychiat. **37**:847-858 (April) 1932. Gardner, W. J., and Shannon, E. W.: Study of 27 Cases of Chronic Subdural Hematomas, Ohio M. J. **39**:835 (Sept.) 1943. Munro, D.: Cerebral Subdural Hematomas, Study of 310 Verified Cases, New England J. Med. **227**:87-95 (July 16) 1942.

3. Bergman, P. S.; Nathanson, M.; and Friedman, E. D.: Results of Exploration in Patients with Clinical Diagnosis of Subdural Hematoma, J. A. M. A. **149**:1529-1532 (Aug. 23) 1952. Echlin, F.: Traumatic Subdural Hematoma—Acute, Subacute, and Chronic: Analysis of 70 Operated Cases, J. Neurosurg. **6**:294-303 (July) 1949. Kennedy, F., and Wortis, H.: "Acute" Subdural Hematoma and Acute Epidural Hemorrhage, Study of 72 Cases of Hematoma and 17 Cases of Hemorrhage, Surg. Gynec. & Obst. **63**:732-742 (Dec.) 1936. Laudig, G. H.; Browder, E. J.; and Watson, R. A.: Subdural Hematoma, Study of 143 Cases Encountered During 5-Year Period, Ann. Surg. **113**:170-191 (Feb.) 1941.

4. LaLonde, A. A., and Gardner, W. J.: Chronic Subdural Hematoma, Expansion of Compressed Cerebral Hemisphere and Relief of Hypotension by Spinal Injection of Physiologic Saline Solution, New England J. Med. **239**:493-496 (Sept. 30) 1948.

TRAINING FOR ESCAPE FROM A SUBMARINE.—In water-filled towers 120 feet high, all submarine personnel undergo regular training in a method of individual escape from a disabled submarine. This training, known as bouyant-assisted ascent, is conducted at increasing depths down to 100 feet. In principle, the method is simple: the trainee, wearing an expanded life jacket, steps out of a pressurized lock into the interior of the column of water where he is held on a platform by two instructors. On a signal from one instructor, the trainee forcibly expels the air from his lungs until he approaches residual lung volume. At this point he is released and rises to the surface at a rate of 300 feet per minute. Throughout the ascent the trainee must continue to blow out air, since the compressed residual air in his chest expands rapidly in accordance with Boyle's Law and can produce over distention of the alveolar structures, resulting in massive arterial air embolism. It is because of this potentially fatal hazard that the Submarine Medical Officer must be in constant attendance, working in the water with the instructors during escape training. In the event of a casualty, the doctor and victim are in a topside recompression chamber and at a treatment pressure of about eighty pounds per square inch within ninety seconds after the accident. This pressure reduces the volume of the air emboli that have flooded the left heart, coronaries, aorta, and cerebral vessels, permitting a resumption of blood flow and survival of the stricken individual, in most cases. . . . Aside from its value as an escape training device, the tank serves as a research medium in which a wealth of data on respiratory physiology is constantly being accumulated by our submarine doctors.—Rear Adm. B. W. Hogan, M.C., Surgeon General, U.S.N. The Practice of Submarine Medicine, *Medical Arts & Sciences*, Second Quarter, 1958.

CLINICAL NOTES

IMPORTANCE OF AUTOPSIES—AN ILLUSTRATIVE CASE

Jack Marks, M.D., Columbus, Ohio
and
Kenneth L. Gerson, M.D., Cleveland

The autopsy examination is sought for a variety of reasons, including augmentation of medical knowledge, clarification of cause of death for medicolegal reasons, and the disclosure of hereditary and infectious disease that might have valuable bearing on survivors.[1] Many of these reasons, however, represent abstractions to next of kin and make no real impression on them.[2] We wish to present an instance wherein the information obtained from an autopsy examination was of critical importance to a family member and may be instrumental in the prolongation of life.

Report of a Case

Our patient was a 15-year-old male initially seen in the outpatient department of the Ohio State University Hospital on Feb. 10, 1958, because of a chest deformity noted at the time of birth and of the type similar to that of the patient's deceased father. He had no symptoms of illness and had experienced no disability whatever with his deformity. He had no particular embarrassment over his chest deformity and enjoyed basketball and other vigorous sports. The patient's medical history included surgical repair of a scrotal varicocele at age 5 and trauma to the right eye, which left a residual coloboma of the iris.

On physical examination, our patient was a thin, tall, white male with a chest deformity of the pectus carinatum type. His height was 73 in. (185.4 cm.), the measurement from pubis to heel was 42 in. (106.7 cm.), measurement from pubis to vertex was 31 in. (73.7 cm.), and the arm span was 75 in. (190.5 cm.). His weight was 126 lb. (57.2 kg.). Blood pressure was 110/68 mm. Hg in both arms. Pertinent physical findings included elongated auricular pinnae and a posttraumatic coloboma of the right iris, with the remainder of the ocular examination thought to have been normal. The palate appeared rather high and arched in character. There was an asymmetrical anterior bulging of the left side of the thorax. The extremities showed marked symmetrical elongation of the long bones of the fingers and toes. The joints of the fingers were somewhat hyperextensible; other joints seemed normal. There were high metatarsal arches bilaterally.

Laboratory data were normal with the exception of an elevated alkaline phosphatase level of 36.5 units, for which no explanation was obtained. The 17-ketosteroid and 17-hydroxycorticosteroid levels were normal. X-rays of the skull were reported normal. A chest x-ray showed anterior bowing of the sternum. The cardiac shadow and aorta were thought to be within normal limits. X-rays of the hands and feet were remarkable only in the length of the metatarsal and phalangeal bones. An electrocardiogram was normal.

Clinical Instructor in Medicine, the Ohio State University Health Center (Dr. Marks), and Intern, Mount Sinai Hospital (Dr. Gerson).

The patient has two siblings, a 17-year-old brother and a 14-year-old sister, neither of whom had been known to have any illness or deformities. The father had died at age 33 in congestive heart failure with a final clinical diagnosis of rheumatic heart disease and possible subacute bacterial endocarditis. He had had six siblings, of whom all are living and well with no known abnormalities. The paternal grandparents lived long lives, and no abnormalities were known in them.

Transcripts of the father's records and slides of specimens obtained at autopsy were sent us from another hospital. It was learned that eight years prior to his death the father had been hospitalized and discharged with diagnoses of psychoneurosis, anxiety-hysteria in type; partial dislocation of the lenses, O. U.; vitreous opacities, O. U.; congenital punctate cataract, O. U.; and tremulous iris, O. U.

Diagnoses at autopsy were given, in part, as follows: old and recent myocardial infarction; nonspecific interstitial myocarditis; left ventricular hypertrophy and dilatation; marginal aortic valvulitis; and sacular aneurysmal dilatation of the ascending aorta and of the first portion of the arch of the aorta. Microscopic examination of the aorta showed medionecrosis with hyaline and mucoid transformation and interruption of the elastic laminae.

Review of the sections from the father's autopsy at the Ohio State University Health Center showed lesions in the heart and aorta as described above. These findings are identical with the changes of Erdheim's medionecrosis which are described in Marfan's syndrome.[2a] On the basis of the above, we concluded that the patient's father had had Marfan's syndrome, as did our patient.

Comment

Marfan's syndrome is an inheritable disorder probably transmitted by a single dominant autosomal gene. It has been thought to cause changes in structures derived from the mesoderm. These defects can be grouped into skeletal, cardiovascular, and ocular manifestations.

The skeletal changes are characterized by gracile body habitus (dolichomorphism) with striking elongation of the distal bones of the extremities (arachnodactyly). Patients with this syndrome are usually tall with characteristic alterations of the proportions of the body. Typically the pubis to heel measurement exceeds the pubis to vertex measurement and the arm span is greater than the height. Involvement of the calvarium results in a long appearance of the skull (dolichocephaly). Associated changes of the skull are highly arched palate and long narrow faces. Cleft palate is a rare finding.[9]

The rib cage is frequently involved and results in a funnel-shaped chest (pectus excavatum), pigeon breast chest (pectus carinatum), or other asymmetrical chest deformities. A weakness of ligaments, tendons, fascia, and joint capsules results in hyperextensibility and recurrent dislocations of joints, pes planus, pes cavus, genu recurvatum, and hernias. Ectopia lentis, almost always bilateral, is found in 50 to 80% of the reported cases. The lens is usually small, spherical, and displaced upward. Myopia is frequent, due to excessive length of the eyeball. Retinal detachments occur frequently. Iritis and glaucoma resulting from the displaced lens may be responsible for limitation of vision or even total blindness.

The cardiocascular system is diffusely involved. Aortic insufficiency results in left ventricular hypertrophy. Diffuse interstitial myocardial changes have been described.[4] Marginal valvular thickenings have been noted, and these can be readily differentiated microscopically from those of rheumatic endocarditis. Dilatation of the ascending aorta and aneurysm are frequently noted. Dissecting aneurysm may occur as an initial sign or may follow aortic insufficiency. Defects in the pulmonary artery and the innominate and carotid arteries are less commonly seen.[5] Weakness in the walls of the veins, apparently similar to that in the arteries, may result in varicose veins.[6]

Other aspects of the disorder have been described,[7] including muscular underdevelopment and hypotonia. Deafness is reported [8] to occur in 6% of the cases. Pulmonary malformations and cystic disease of the lung have been thought to be a component of the disease. McKusick [9] has published a comprehensive study of Marfan's syndrome.

In the papers of Griffin and Koman [10] and Marvel and Genovese,[11] a total of 55 cases of Marfan's syndrome were collected, with 48 patients surviving the first year of life. Of these, there was a range of life span of 1 to 55 years and a mean life span of 27.5 years.

Wilson [2A] has recently described three generations of a family affected with Marfan's syndrome. He stated that the degree of physical activity of the individual probably is important in determining the rate at which aortic dilatation occurs. He cited a patient who led a quiet life and felt that the patient's sedentary existence had probably contributed to a prolonged life span.

We therefore counseled the parent to have our patient desist from vigorous athletic competition. We suggested that he be given a type of education preparatory for sedentary work. The significance of this disease with relation to marriage and child bearing was discussed. The counsel given the parent most certainly involves a major alteration to the patient's manner of living and might not have been justifiable without verification of the diagnosis of Marfan's syndrome.

Summary

House officers are frequently faced with the responsibility of requesting autopsy permission from next of kin. Often resistance is encountered for a variety of reasons, some of which are religious, some superstitious, and some simply based on a morbid displeasure of the concept of the autopsy examination. Too often the reasons set forth by the physician to next of kin represent abstract ideas with no apparent immediate benefit for the surviving family. We have found an instance in which information obtained from the autopsy of a father may prolong the life of his son. We believe this case to represent a valuable instance for house officers to draw on in their discussions concerning permission for autopsy with families of their deceased patients.

2620 Schaaf Dr. (9) (Dr. Marks).

References

1. Maisel, A. G.: Truth About Autopsies, Reader's Digest **68**:104-108 (April) 1956. Brown, D. E.: High Autopsy Percentage, New England J. Med. **251**:859-860 (Nov. 18) 1954.

2. Folkman, J. D.: Grief, read before staff meeting, White Cross Hospital, Columbus, Ohio, February, 1957.

2A. Wilson, R.: Marfan's Syndrome: Description of Family, Am. J. Med. **23**:434-444 (Sept.) 1957.

3. Ross, L. J.: Arachnodactyly: Review of Present Literature and Report of Case with Cleft Palate, Am. J. Dis. Child. **78**:417-436 (Sept.) 1949.

4. Pappas, B. G.; Mason, D.; and Denton, C.: Marfan's Syndrome: Report of Three Patients with Aneurysm of Aorta, Am. J. Med. **23**:426-433 (Sept.) 1957.

5. Austin, G. A., and Schaefer, R. F.: Marfan's Syndrome, with Unusual Blood Vessel Manifestations, A. M. A. Arch. Path. **64**:205-209 (Aug.) 1957.

6. Steinberg, I.; Mangiardi, J. L.; and Noble, W. J.: Aneurysmal Dilatation of Aortic Sinuses in Marfan's Syndrome, Circulation **16**:368-373 (Sept.) 1957.

7. Sinclair, R. J. G.: Marfan Syndrome, Bull. Rheumat. Dis. **8**:153-154 (Jan.) 1958.

8. Rados, A.: Marfan's Syndrome (Arachnodactyly Coupled with Dislocation of Lens) Arch. Ophth. **27**:477-538 (March) 1942.

9. McKusick, V. A.: Heritable Disorders of Connective Tissue, St. Louis, C. V. Mosby Company, 1956.

10. Griffin, J. F., and Koman, G. M.: Severe Aortic Insufficiency in Marfan's Syndrome, Ann. Int. Med. **48**:174-187 (Jan.) 1958.

11. Marvel, R. J., and Genovese, P. D.: Cardiovascular Disease in Marfan's Syndrome, Am. Heart J. **42**:814-825 (Dec.) 1951; correction **43**:320 (Feb.) 1952.

SPECIAL REPORT

FEDERAL MEDICAL-HEALTH SPENDING FOR FISCAL YEAR 1959 (JULY 1, 1958, TO JUNE 30, 1959)

The federal government's medical activities are on a massive scale and they continue to grow. This year for all health programs (research, medical care, public health) Uncle Sam is spending about 62.6% more than he did five years ago, 13.5% more than last year. Programs in 22 separate agencies and departments of government range from cancer research to federal employee clinics. The total cost is 2.8 billion dollars, or 344.7 million dollars more than last year. Right now the agencies and the Bureau of the Budget are working on requests to be presented to Congress in January. There is little question that the bills, when finally enacted next year, will set another new high for medical spending.

For six years now the Washington Office of the American Medical Association, through this annual budget report, has charted this expanding course of federal medical activity, a service not performed by any other organization. We identify all programs, describe their purpose, give their present appropriations, and note the amount of increase. We do not attempt to evaluate them—to rate them as good, bad, or indifferent; as wasteful or invaluable. This is a factual study, based on scrutiny of appropriation acts passed by the last Congress and information supplied us by program and fiscal officers in the various departments and agencies, all of whom gave us their wholehearted cooperation. It covers the current fiscal year which ends next June 30.

TABLE 1.—*Medical-Health Budgets of Federal Departments, Agencies, and Commissions for This Fiscal Year*

Agency	Fiscal 1959	Fiscal 1958	Page
Department of Health, Education, and Welfare	$1,116,207,896	$849,395,800	3-10
Veterans Administration	843,524,000	849,374,000	10-11
Department of Defense	751,115,000	702,305,000	12
Atomic Energy Commission	45,462,000	40,085,000	13
International Cooperation Admin.	39,600,000	37,300,000	13
Department of State	21,638,280	15,718,110	13-14
National Science Foundation	19,575,000	7,500,000	14
Office of Civil and Defense Mobilization	13,617,000	3,177,000*	15
Federal Employees Health Programs	11,600,000	10,000,000	15
Department of Labor	8,827,000	8,009,478	15
Panama Canal Co. and Panama Canal Zone Government	3,959,900	5,988,300	16
Department of Treasury	3,854,500	3,837,850	16
Department of Justice	2,105,000	1,796,000	16
District of Columbia	2,000,000	3,700,000	17
Federal Trade Commission	1,600,000	1,500,000	17
Department of Commerce	1,212,400	911,300	17-18
Civil Service Commission	436,000	367,000	18
President's Comm. for Employment of the Physically Handicapped	214,700	182,575	18
Small Business Administration	150,000	70,000	18
Department of the Interior	140,000	154,950	19
National Advisory Committee to Selective Service	19,000	19,000	19
Office of the Attending Physician of Congress	13,145	12,145	19
Totals	$2,886,260,821	$2,541,483,508	

* The figure for fiscal 1958 is the appropriations of the Federal Civil Defense Administration and the Office of Defense Mobilization; now combined in the Office of Civil and Defense Mobilization.

While nearly 38 million people are eligible to receive all or part of their medical care from or through the federal government, medical care represents only a part of the total spent by the U. S. in medical fields. Many millions of dollars go for research, drug control, personnel training and other efforts not directly related to the rendition of medical care.

As in last year's report, we have listed in table form payments to disabled persons through programs which the federal government finances entirely or in part. Such beneficiaries now total nearly 6,000,000, a 15% increase over last year. Money paid them has increased to 4.75 billion dollars, over 40% more than last year. These data are on the last page, separated from the rest of the report because not all of the money is federal.

This report was prepared by the Washington Office of the American Medical Association.

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE (This Year: $1,116,207,896—Last Year $849,395,800)

Division of Hospital Facilities.....$187,800,000
last year: $122,650,000

This division administers the federal aspects of both the original and expanded Hill-Burton programs. In 1958 Congress enacted legislation which authorizes loans in lieu of grants for any of the eligible projects under the entire program. Since 1946 the federal contribution through June 30, 1958, amounts to $1,024,000,000; when the sponsors' share is included, the total is $3,323,000,000 (these figures are for both the original and the expanded program). This is the first time since fiscal 1950 that the appropriation has reached $150,000,000 for the original program plus the categorical programs. Total appropriations are divided into the following four categories:

Hill-Burton Original Program.....$150,000,000
last year: $ 99,000,000

This appropriation, allotted to the states on the basis of population and per capita income, assists in the financing of new hospitals and related health facilities construction under the original Hill-Burton program. To June 30, 1958, federal funds have partially financed approximately 3,476 projects, including 159,745 hospital beds, 768 public health centers, 23 state health laboratories and something in excess of 100 nurses' homes and training facilities.

Medical Facilities—Category Program.....$35,000,000
last year: $21,000,000

The total allotted to the state this year on a population-per capita-income formula will assist in the financing of new construction under the 1954 amendments in four categories as follows: $7,500,000 for hospitals for the chronically ill and impaired; $7,500,000 for diagnostic centers, or diagnostic and treatment centers; $10,000,000 for nursing homes; and $10,000,000 for rehabilitation facilities. As under the original program, the federal share may range from one-third to two-thirds of the total project cost. As of June 30, 1958, a total of 496 projects had been approved, divided among the four categories as follows: facilities for chronically ill (98), diagnostic-treatment centers (196), nursing homes (125), and rehabilitation facilities (82).

Hill-Burton Administrative Expenses.....$1,600,000
last year: $1,450,000

This appropriation is used for administration, including salaries and expenses for the hospital survey and construction program for the federal headquarters and for eight regional federal offices.

Research $1,200,000
last year: $1,200,000

Authorized in 1949 but not appropriated until 1955 is this item for research, experiments and demonstrations on utilization of hospital services, facilities and resources. The bulk of the money is assigned as grants to states, universities, hospitals, hospital associations, professional associations, and community organizations and a small amount for direct research by U. S. Public Health Service.

National Institutes of Health.....$324,383,000
last year: $241,183,000

National Cancer Institute.....$75,268,000
last year: $56,402,000

About 50% of this appropriation is earmarked for grants to non-federal individual investigators and private institution for research and training. Almost 25% will be used to support contracts with the pharmaceutical and chemical industries in research on chemotherapeutic agents for the treatment of cancer. The states receive $2,250,000 for cancer

control work. $4,212,000 will provide professional and technical assistance to public and private institutions engaged in prevention, diagnosis, and treatment among individuals and large population groups (cytology activities) and environmental cancer activities. The balance is for direct research operations, including salaries, supplies, and this Institute's share in the cost of operating the Bethesda (Md.) Clinical Center and related auxiliary services.

National Heart Institute.....$45,613,000
last year: $35,936,000

Grants to non-federal individual investigators and public and private institutions for research and training take about 75% of the appropriation. $2,125,000 is allocated to states for heart disease control. The balance is for direct research operations, including salaries, supplies, and this Institute's share in the cost of operating the Bethesda (Md.) Clinical Center and related auxiliary services.

Mental Health Institute.....$52,419,000
last year: $39,217,000

Approximately 75% of this appropriation is apportioned for research and training through grants to individual investigators and public and private institutions. The sum of $4,000,000 is allocated to the states for community mental health services. The remainder is for direct research operations, including salaries, supplies, and this Institute's share in the cost of operating the Bethesda Clinical Center and related auxiliary services.

Arthritis & Metabolic Diseases Institute.....$31,215,000
last year: $20,385,000

Grants to public and private investigators for research and training total 75% of this appropriation. The balance is for direct research operations, including salaries, supplies and this Institute's share in the cost of operating the Bethesda Clinical Center and related auxiliary services.

Neurological Diseases & Blindness Institute.....$29,403,000
last year: $21,387,000

Grants to public and private investigators and institutions for research and training total 80% of this appropriation. The remainder is for direct research operations, including salaries, supplies, and this Institute's share in the cost of operating the Bethesda Clinical Center and related auxiliary services.

Allergy & Infectious Diseases Institute.....$24,071,000
last year: $17,400,000

Research grants to public and private investigators for research and training amount to 70% of this appropriation. The remainder is for direct research operations, including salaries, supplies and this Institute's share in the cost of operating the Bethesda Clinical Center and related auxiliary services.

Dental Health Institute.....$7,420,000
last year: $6,430,000

Grants to public and private investigators for research and training total about 60% of this appropriation. $983,000 will be used for technical assistance to states and $320,000 for coordination and development of dental resources. The remainder is for direct research at Bethesda, review and approval of grants, administrative expenses, and for support of the Clinical Center.

National Institutes of Health—General Funds.....$28,974,000
last year: $14,026,000

These funds are administered by the Division of General Medical Science of the National Institutes of Health, with practically all funds being expended for research and training grants, with the exception of $2,236,000 for control of biologics (including polio and flu vaccine), which activity is under the Division of Biologics Standards. The balance goes toward supporting fellowships and administrative expenses relating to grants.

Laboratory Research Construction (NIH).....$30,000,000
last year: $30,000,000

There is available for planning and construction of research facilities $30,000,000 the authority for which is Public Law 835 (84th Cong.). To be eligible for grants, the applicant must be a public or nonprofit institution determined by the Surgeon General, after consultation with the National Advisory Council on Health Research Facilities, to be competent to engage in the type of research for which the facility is to be constructed. This is the third year of this program's operation.

Water Pollution Control.....$45,000,000
last year: $47,500,000

Under Public Law 660, enacted in 1956, the Federal Government makes grants for the construction of waste treatment plants. Although $45,000,000 was appropriated for fiscal 1959, the funds allocated to the states will be based on the $50,000,000 authorized in the basic legislation.

Hospitals and Medical Care.....$48,454,000
last year: $44,399,000

These funds are used for operational costs and maintenance of PHS hospitals and health services in caring for American seamen, Coast Guard and Public Health Service personnel and their dependents, federal employees injured at work, leprosy patients and narcotic addicts, and includes studies in the development and coordination of nursing resources. It also includes $1,000,000 for payments to Hawaii for care of patients suffering from leprosy and $5,800,000 for nurse training grants. Not shown in the appropriation is approximately $4,500,000 additional income, principally from other federal agencies for reimbursable services.

Indian Health Activities.....$44,597,000
last year: $43,230,300

Under Public Law 568 (83rd Cong.), PHS assumed responsibility for the health of American Indians and natives of Alaska which formerly was a function of Interior Department. The total is broken down as follows: hospital care in Indian hospitals, $23,756,000; contract patient care, $8,000,000; field health services $6,620,000; program direction and management services, $2,097,000; and modernization of hospitals and construction of facilities $4,124,000. In addition, the Indian health activities of PHS will receive approximately $740,000 as reimbursements from other governmental agencies for services rendered in PHS facilities.

Assistance to States—General.....$22,889,000
last year: $22,592,000

Grants totaling $15,000,000 will be available for allocation to the states in support of state and local general public health activities. These grants must be matched one state dollar for every two federal dollars. U. S. Public Health Service will spend $5,889,000 to provide technical assistance, consulting services to states, expenses of the National Office of Vital Statistics, international health activities, demonstrations, training activities, and operational expenses. A total of $2,000,000 will be available for grants to schools or direct traineeship awards to individuals for the training of professional public health personnel.

Sanitary Engineering Activities.....$12,815,000
last year: $12,640,000

This program is made up of seven activities as follows: air pollution control, $3,860,000; water supply and water pollution control, $6,600,000; radiological health activities, $608,000; milk and food sanitation activities, $492,000; interstate carrier and general sanitation activities, $510,000; Sanitary Engineering Center research activities, $440,000; and administration, $305,000.

Tuberculosis Control.....$6,386,000
last year: $7,000,000

Grants to states for diagnostic and treatment clinics, mass case-finding and follow-up services account for $4,000,000, all of which has to be matched equally by the states. The remainder is for direct operations of PHS.

Communicable Disease Activities.....$8,300,000
last year: $6,250,000

The entire appropriation is used for direct activities of the PHS Communicable Disease Center at Atlanta, Ga., and its affiliated operations. The Center carries on studies in epidemiology, furnishes laboratory diagnostic services and sponsors special projects to assist states. This amount includes $1,700,000 for equipment for the new Communicable Disease Center which is now under construction in Atlanta.

Office of the Surgeon General.....$5,260,000
last year: $5,100,000

For administrative expenses of this office, including all housekeeping services, evaluation of public health needs, and personnel training. Included also is approximately $1,389,400 for administration of the National Health Survey Act authorized by Public Law 652 (84th Cong.).

Venereal Disease Control.....$5,400,000
last year: $4,415,000

Of the total, $2,400,000 goes for direct grants to states for venereal disease detection, treatment and control on a special-need basis. Most of the remainder is spent for technical assistance to the states, including funds to pay 258 federal employees, the majority of whom are assigned to state health departments.

Foreign Quarantine Service.....$4,108,000
last year: $3,876,000

This service operates 310 medical quarantine stations on borders of the United States. It also operates 28 medical examination stations on foreign soil for the examination of aliens seeking visas to enter the U. S. Inspections are made of all seagoing vessels and aircraft entering the U. S. It is estimated that the service will examine more than 3,100,000 aliens in this country and 210,000 abroad.

Alaska Health and Sanitation Programs.....$8,665,000
last year: $2,165,000

This appropriation will be divided as follows: $638,000 for grants to Alaska for public health services; $527,000 for research activities of the Arctic Health Research Center at Anchorage; $1,000,000 to enable Alaska to pay for hospitalization for Alaska's mentally ill at Morningside Hospital in Portland, Oregon; and $6,500,000 for construction of mental health facilities in Alaska as authorized by the Alaska Mental Health Act.

National Library of Medicine.....$8,365,000
last year: $1,450,000

As a result of Public Law 941 enacted in 1956, the Armed Forces Medical Library was renamed the National Library of Medicine and transferred to the Department of Health, Education, and Welfare. A new structure has been authorized to house the Library and $6,950,000 in construction funds was appropriated for 1959. The new Library will be built on the southeast corner of the NIH reservation at Bethesda.

Reimbursable Health Programs for Other Governmental Agencies.....$487,000
last year: $475,000

This represents the cost of services expected to be advanced to Public Health Service by other governmental agencies for establishing and operating on-the-job clinics. PHS deals largely with Washington personnel, whereas 90% of the total number of government's employees are located outside the greater Washington area.

Freedmen's Hospital.....$2,975,000
last year: $3,000,000

This institution with an average patient load of 328, plus 32 new-borns, is a medical teaching facility and general hospital. Its patients are chiefly medical indigents from the District of Columbia and the adjoining area. The hospital is utilized for training of interns and residents, chiefly from Howard University, and it has a nurses' training school. A total of $4,267,000 is authorized for operating costs. All in excess of $2,975,000 (appropriated for fiscal 1959) are expected reimbursements from charges made to patients and payments made by the District of Columbia and other federal agencies and from the counties surrounding Washington who utilize these facilities for welfare patients. Some supervisory functions over this program is vested in PHS.

Howard University.....$1,022,000
last year: $1,136,000

This University came into being shortly after the close of the Civil War because of the lack of higher educational facilities for negroes. It is jointly supported by congressional appropriations and private funds and offers instruction in ten schools and colleges, including colleges of medicine, dentistry, and pharmacy. This year the University's total operational budget is in excess of $8,000,000. Of this amount, the Federal Government will contribute $4,350,300 toward operational expenses, $123,000 for plans for construction, and $163,000 for completion of a men's dormitory. The combined budgets for the colleges of medicine, dentistry, and pharmacy will require approximately 24% of the University's total budget. The entire student body of the University for 1958-59 will be approximately 5,500. There are 350 students enrolled in the college of medicine, 289 in the college of dentistry and 133 in the college of pharmacy. The federal contribution for direct current operations in the colleges of medicine, dentistry, and pharmacy total approximately $1,022,000, according to the University's treasurer.

St. Elizabeths Hospital.....$17,082,000
last year: $15,904,500

St. Elizabeths provides treatment for several classes of mentally ill persons, including those residing in the District of Columbia, beneficiaries of the Veterans' Administration, beneficiaries of Public Health Service, insane persons charged with or convicted of crimes in U. S. courts (including the Court of the District of Columbia), certain American citizens found insane in Canada, the Panama Canal Zone and the Virgin Islands, certain foreign service personnel, and members of the military services admitted to the hospital prior to July 16, 1946. Congress appropriated $3,186,000 to this institution for operational expenses $87,000 for major repairs, and $125,000 for construction planning. Reimbursements from other agencies will approximate $13,684,000. This hospital has an average daily patient load of 7,000.

Bureau of Public Assistance (Medical Payments).....$240,000,000
last year: $150,000,000

Out of a total budget of approximately $3.2 billion (federal and state) for categorical public assistance programs, officials of the Social Security Administration estimate that approximately 12.8% is now being devoted to health care of recipients. For all facets of living expenses and medical care, the total federal contribution this year will be about $1.9 billion. An estimated $410 million of federal, state, and local funds are expected to be paid for medical and health needs of categorical assistance recipients this fiscal year. About $330 million will be paid to vendors of medical care, such as physicians, hospitals, pharmacists, nursing homes, etc., and about $80 million directly to recipients to enable them to meet their medical care needs. The federal share of combined medical payments to vendors and to recipients will be about $240 million.

Office of Vocational Rehabilitation.....$57,800,000
last year: $50,830,000

Under the expanded Vocational Rehabilitation Act (Public Law 565, 83rd Cong.), Congress this year appropriated $56,400,000 for grants to states and other agencies. This is divided as follows: (a) support of basic rehabilitation services, including medical examinations, surgical and therapeutic treatment, hospitalization, prostheses, occupational tools and aids, vending stands, rehabilitation facilities, vocational training and funds for maintenance (based on per capital income and population as in Hill-Burton), $45,500,000; (b) extension and improvement of state programs, $1,500,000; (c) special grants to states or nonprofit organizations for projects designed to expand the rehabilitation program (2-1 federal-state matching), $4,600,000; (d) $4,800,000 for training of

rehabilitation personnel, including physicians, therapists, psychologists, counselors, medical and psychiatric social workers. In addition $1,400,000 is available for federal administrative costs.

Children's Bureau $32,300,000
last year: $32,300,000

Operating under the Social Security Administration, the Children's Bureau administers grants to states for maternal and child health, and crippled children's and child welfare services. This year grant money totals $43,500,000 divided as follows: $16,500,000 for maternal and child health work; $15,000,000 for crippled children's services; and $12,000,000 for child welfare services. However, this last item has no medical significance and, therefore, it is not reflected in the total of $32,300,000. One-half of the federal funds for maternal and child health and crippled children's services is required to be matched dollar for dollar by the states. In addition the Children's Bureau has $2,000,000 to finance investigating and reporting activities and to administer all the grants. About 40% of this amount is chargeable to the health and related activities of the Children's Bureau which include administration of grants for maternal and child health and crippled children's services and consultative services to state agencies and other public and voluntary agencies and organizations engaged in the provision of maternal and child health services.

Federal Surplus Property Donation Program..... Approx. $18,319,806
last year: $15,200,000

The Department of HEW has authority to make donations of personal property and transfer of real estate declared surplus by federal agencies for health needs. In the case of real estate, conditional title is vested in the transferee and then after a number of years of utilization of the property in accordance with imposed conditions the property can become absolutely vested. Recipients of personal property may be medical institutions, health centers, hospitals and clinics. Eligible donees of real property may be any institutions organized for health purposes, including those engaging in medical research. It is difficult to determine the exact value of property donated and transferred since accounting is on the basis of acquisition cost. Last year approximately $60,910,000 of personal property (acquisition value) was allocated for health purposes which probably had a fair market value of roughly $18,000,000. During the same period, approximately $1,229,582 of real estate (acquisition value) was transferred with a fair market value of $319,806. It is expected that the level of donations and transfers for the current fiscal year will be in line or slightly in excess of last year's totals.

Food and Drug Administration..... $9,800,000
last year: $9,300,000

For administering the Food, Drug and Cosmetic Act, Congress voted the above funds. FDA will also realize an estimated $1,410,000 from fees paid by industry for certification of antibiotics, insulin, etc.

U. S. Office of Education..... $4,000,000
last year: $4,000,000

For a number of years the Office of Education has been making grants to states chiefly for vocational education. During the last fiscal year approximately $4,000,000 was made available as grants to aid the states in the training of practical nurses. For this year, the Office of Education has available approximately $34,000,000 for grants to states, of which $4,000,000 is again earmarked for the practical nurse training program.

VETERANS ADMINISTRATION

(This Year: $843,524,000—Last Year: $849,374,000)

In-Patient Care in VA Hospitals*..... $675,298,000
last year: $657,071,000

VA's largest single medical expenditure covers in-patient care in 173 VA hospitals and provides for an estimated 120,954 beds. At present VA reports an estimated daily patient load of 111,063, approximately 92% of bed capacity. The appropriation includes salaries of physicians and other personnel, medical rehabilitation of veterans, dietetic and nursing services, social services and special services, such as recreation and transportation of veterans.

Out-Patient Care*..... $75,399,000
last year: $79,000,000

The bulk of this appropriation is for out-patient care in about 100 VA clinics. The remainder is earmarked for fees to physicians ($8,079,000) and dentists ($1,048,000) under the home-town care program.

Modernization and Replacement Construction*.... $16,595,000
last year: $42,500,000

This amount is for work on existing units where costs exceed $300,000 per project and equipment for new units. The money is available until expended. (See Alterations and Improvements item on this page for small projects.)

Domiciliary Care*..... $31,812,000
last year: $31,490,000

Domiciliary care is being provided in 17 VA facilities for about 16,810 veterans who, while incapacitated for employment, are not in need of full hospital care. VA also makes payments to 33 state veterans homes with a daily patient load of approximately 9,500. Payments this fiscal year are estimated at $6,440,000. Under Public Law 613 (83rd Congress) federal contributions to these homes were raised from a maximum of $500 to $700 a year per patient.

Contract Hospitalization*..... $13,557,000
last year: $13,389,000

This appropriation finances an average daily patient load of 3,117 veterans in federal hospitals other than VA and in state and municipal hospitals. Patients in federal non-VA hospitals are estimated at 1,324 and in non-federal hospitals, 1,676. Mental cases make up the largest single category of contract cases.

Medical Administration*..... $7,175,000
last year: $7,862,000

To operate the VA Department of Medicine and Surgery in the central office and the seven area medical offices; included are salaries, travel and like expenses.

Medical Research*..... $16,344,000
last year: $11,344,000

For research, mostly in VA hospitals. The breakdown: general medical and surgical research, $9,600,700; atomic medical research, $2,803,300; prosthetics testing, $1,000,000; neuropsychiatric, $1,639,100; tuberculosis, $1,130,900; other, $150,000.

Alterations, Improvements and Repairs*..... $2,700,000
last year: $2,028,000

For alterations, improvements and repairs to VA clinics and domiciliaries (costing less than $300,000 per project).

Supply Depot Operations*..... $2,055,000
last year: $1,790,000

For maintaining and operating supply depots handling the purchase, shipping and storage of medical supplies and equipment used by the Department of Medicine and Surgery.

Medical Education and Training*..... $1,339,000
last year: $1,400,000

For VA training programs for physicians and other VA personnel in medical specialties and auxiliary services.

*In appropriating for VA, Congress stipulated that the funds were predicated on furnishing care and treatment for 140,490 beneficiaries during this year. This total of beneficiaries was arrived at by adding the estimated number of veterans to be cared for in VA hospitals, domiciliary facilities, contract hospitals, and state veterans homes. There is no way of estimating whether more or fewer patients than this total will be cared for during the year. If VA doesn't furnish care at this level, its funds will be reduced proportionately.

Medical Care—Philippine Veterans.....$1,250,000
last year: $1,500,000

Until 1960 the U. S. will contribute for the medical care of Philippine veterans.

DEPARTMENT OF DEFENSE

(This Year: Approx. $751,115,000—Last Year: Approx. $702,305,000)

Army Medical Services*.....Approx. $295,000,000
last year: $270,700,000

The estimated cost includes expenses normally associated with the operation of military hospitals and dispensaries, military and civilian salaries, medical supplies and equipment, utilities, communications, transportation travel subsistence, maintenance and repair of buildings and grounds, expenses for construction, dependent medical care, medical education and training, medical research and preventive medicine.

Air Force Medical Services*.....Approx. $221,000,000
last year: $211,400,000

The estimated cost includes expenses normally associated with the operation of military hospitals and dispensaries, military and civilian salaries, medical supplies and equipment, utilities, communications, transportation travel subsistence, maintenance and repair of buildings and grounds, expenses for construction, dependent medical care, medical education and training, medical research and preventive medicine.

Naval Medical Services*.....Approx. $235,000,000
last year: $220,100,000

The estimated cost includes expenses normally associated with the operation of military hospitals and dispensaries, military and civilian salaries, medical supplies and equipment, utilities, communications, transportation travel subsistence, maintenance and repair of buildings and grounds, expenses for construction, dependent medical care, medical education and training, medical research and preventive medicine.

Office, Asst. Secretary of Defense
(Health & Medical).....Approx. $115,000
last year: $105,000

For salaries, travel and administration of this office, and for travel expenses and consultant fees for the Defense Department Civilian Health and Medical Advisory Council.

The 85th Congress placed restrictions on the Dependents Medical Care Program (Medicare). Because of these changes, reliable program cost estimates cannot be made at this time.

ATOMIC ENERGY COMMISSION

(This Year: $45,462,000—Last Year: $40,085,000)

The Atomic Energy Commission's Division of Biology and Medicine has about $5.4 million more than last year for research projects. This year's total includes the following spending plans: cancer, $4,172,000; other medical, $12,268,000; biological, $14,104,000; biophysical, $1,784,000; development of new laboratory equipment, $2,498,000; vocational and special training, $2,220,000; radioisotope distribution, $310,000; environmental science, $5,394,000; and miscellaneous items, $2,712,000.

*A Defense Department source gives this explanation: All dollar amounts are estimates and have been rounded because military appropriations are not broken down into categories of medical expenditures. The estimated increase during fiscal year 1959 in the total military medical programs (about $49 million higher than was estimated in October of 1957 for the fiscal year 1958) is primarily attributable to an increase in the cost of goods and services and because of an increase in salaries for military and civilian personnel, approved in the latter part of fiscal year 1958. It is estimated that the average daily patient load will approximate the same as for fiscal 1958 and that in the combined military services in-patient hospital care this year will cost about $319 million. Out-patient care, which will cost about $171 million because of an estimated 34,000,000 out-patient visits, excluding dental visits, reflects a small reduction in workload due to reduction in military population.

INTERNATIONAL COOPERATION ADMINISTRATION

(This Year: $39,600,000—Last Year: $37,300,000)

Technical Cooperation Health Programs.....$14,000,000
last year: $14,000,000

The International Cooperation Administration through cooperatively financed programs is helping 44 countries, at their request, to improve their health and living conditions. The broad range of health projects falls into the fields of: (1) epidemic and infectious disease (malaria, trachoma, smallpox, typhoid); (2) environmental sanitation (safe water systems and sewage disposal); (3) development of rural health services and facilities (health centers, hospitals, clinics, laboratories); (4) training of personnel both locally and in the United States; (5) the establishment and development of basic health training institutions (schools of nursing, schools of public health).

Malaria Eradication Program.....$25,600,000
last year: $23,300,000

In the Mutual Security Act, the 85th Congress authorized U. S. participation in a world-wide malaria eradication program not to exceed the amount indicated above.

DEPARTMENT OF STATE

(This Year: $21,638,380—Last Year: $15,718,110)

United Nations Children's Fund.....$11,000,000
last year: $10,000,000

The United States' share of the Children's Fund is up about $1,000,000 over last year for a total of $11,000,000. The percentage of U. S. contribution to the total fund has dropped slightly from 55% to 52.5%. Other governments increased contributions from $8.2 million last year to $9.9 million this year. There are 81 contributing governments and territories. The fund is aiding 324 health and medical projects in 104 territories and benefiting 50 million children and others. More than 45,000,000 children and pregnant and nursing mothers benefited directly from the Fund last year. More than 14,000,000 children were vaccinated against tuberculosis, some 28,000,000 were protected with DDT against malaria, some 2,800,000 children and mothers were treated for yaws, bejel, or syphilis, 900,000 children were treated for tracoma.

World Health Organization.....$7,424,380
last year: $4,200,110

This country's share of the WHO budget remains at about one-third of the total assessments of the 85 member governments. Last year WHO was sponsoring about 600 projects in 117 countries and territories. WHO's overall budget is broken down this way: approximately 88% for operating programs, 9% for administration, and the rest for organizational meetings. WHO actually had three appropriations from the U. S. The first is for $4,666,480 for its general activities; the second for $300,000 for research; and the third for $5,000,000 for malaria eradication which will come from ICA's $25,600,000. This organization also administers $5,462,000 obtained from the U. N. technical assistance program. Approximately $2,457,900 of this total comes from the U. S.

Pan American Sanitary Bureau.....$1,914,000
last year: $1,518,000

The United States is contributing approximately two-thirds of the Bureau's regular budget which this calendar year totals $3,000,000. In addition, this country hopes to allocate $3,000,000 for 1959 malaria eradication programs which will come from ICA's $25,600,000 (see above). The Bureau, in existence many years before WHO was organized, is the regional office of WHO for the Americas. The Bureau is sponsoring health programs in 20 Latin American countries, dependent territories of European powers in this hemisphere, and the United States.

Health Program for Overseas Employees.....$1,300,000
(new program)

The Department of State furnishes health care to 10,000 overseas employees and approximately 15,000 of their dependents. In the case of dependents, the government pays

for medical care only after the first $35 of expense incurred for a single illness. In most cases, military medical facilities of our government overseas and facilities operated by the United States Public Health Service are utilized. However, in some cases private physicians and private hospitals are used.

NATIONAL SCIENCE FOUNDATION

(This Year: $19,575,000—Last Year: $7,500,000)

The Foundation's overall budget of $130,000,000 is $90,000,000 above last year's appropriation. The sum of $19,575,000 is earmarked for research grants in the biological and medical sciences. The Foundation provides support for basic scientific research, for training and education in the sciences through fellowships and programs to improve science teaching, and programs to improve exchange of scientific information.

OFFICE OF CIVIL AND DEFENSE MOBILIZATION

(This Year: $13,617,000—Last Year: $3,177,000)

Under Reorganization Plan No. 1 of 1958, the Federal Civil Defense Administration and the Office of Defense Mobilization were consolidated into what is now the Office of Civil and Defense Mobilization. The total budget for this new agency is $45,285,000. The health and medical activities will expend $13,617,000 broken down as follows: salaries and expenses, $403,000; research $179,000; education (medical education for national defense), $135,000; federal medical stockpiling, $12,400,000; federal matching contributions re medical equipment for state agencies, $500,000.

FEDERAL EMPLOYEES HEALTH PROGRAMS

(This Year: $11,000,000—Last Year: $10,000,000)

Another health program, this one available to all federal civilian workers, provides limited services through health clinics. They are operated by federal agencies which employ 300 or more persons in any one area. By regulation, maximum cost of a health service cannot exceed $13 a year per employee, although special industrial conditions or minimal size units may warrant a higher ceiling. Services include treatment for on-the-job illness and physical examinations for employment.

DEPARTMENT OF LABOR

(This Year: $8,827,000—Last Year: $8,069,476)

Bureau of Employees' Compensation.....$8,200,000
last year: $7,500,000

An estimated 2,337,000 federal workers are eligible under the Federal Employees' Compensation Act for medical and hospital care, rehabilitation services, disability and death payments, funeral and burial expenses. For treatment of employees by private doctors and hospitalization in private facilities, the Labor Department has set aside $6,200,000 this fiscal year, and for similar services in federal hospitals and clinics, $2,000,000. Expenditures for care by non-governmental physicians and in private hospitals has been increased by $545,000 over last year's spending level.

Bureau of Labor Standards.....$627,000
last year: $569,476

For promotion of industrial safety, the Bureau plans to spend $412,300, and for re-employment programs of the physically handicapped, $214,700. The agency develops standards for hazardous occupations, assists the states in accident prevention programs and assist states and unions in training safety personnel.

PANAMA CANAL COMPANY AND PANAMA CANAL ZONE GOVERNMENT

(This Year: $3,959,900—Last Year: $5,988,300)

Expenditures for fiscal 1959 for operation of Canal Zone hospitals and clinics is estimated at $6,343,800. Medical services are available to Zone employees and their dependents, certain military and other persons. Some of these patients make payments toward the cost of their medical care, which payments are returned to the United States Treasury. In 1959 such revenue is estimated at $3,266,200. When last year's report was compiled, the revenue figure was not obtainable. Expenditures for operating public health activities, including sanitation, health director's office, Division of Veterinary Medicine, preventive medicine and quarantine and general government expense applicable to the Health Bureau, should total $882,300. The four hospitals operated by the Health Bureau of the Canal Zone Government contain 1008 beds as follows: Gorgas Hospital (440), Coco Solo Hospital (148), Corozal (300), Palo Seco Leprosarium (120). In addition there are two dental clinics, one medical clinic and five first-aid stations.

DEPARTMENT OF TREASURY

(This Year: $3,854,500—Last Year: $3,837,850)

The Bureau of Narcotics, operating within the Treasury Department, is primarily engaged in investigation, detection and prevention of violations of the federal narcotic and marihuana laws. Subsidiary functions are: (1) exercising control over the legitimate manufacture and distribution of narcotics within the United States through a quota-system and supervision over approximately 302,000 qualified registrants (physicians, pharmacists, dentists, wholesalers, etc.); and (2) training of narcotics law enforcement officers sponsored by local and state law enforcement agencies. Increased emphasis is being placed on drying up interstate and international sources of illicit supplies.

DEPARTMENT OF JUSTICE

(This Year: $2,105,000—Last Year: $1,796,000)

The figure represents the Bureau of Prisons' estimate of the cost of medical and dental services for approximately 22,000 prisoners in 30 federal penal institutions. The bulk (about $2,000,000) goes to commissioned officers of the Public Health Service assigned to the prisons and to related civil service personnel for services that include psychiatric, medical, surgical, nursing and dental treatment. Another approximately $105,000 is earmarked for fees to 220 consultants in various medical specialties.

DISTRICT OF COLUMBIA

(This Year: $2,000,000—Last Year: $3,700,000)

Only a rough estimation can be made of the federal contribution for health and medical programs of the District of Columbia. The total District budget for all governmental functions is in the neighborhood of $204,000,000. Congress has appropriated $20,000,000 for this year toward the cost of the District government or about one-tenth of the total. The District Health Department will expend $32,605,000. In this amount is included approximately $12,498,000 for care of the District's insane in St. Elizabeths Hospital. Since such sum is shown in this report under St. Elizabeths Hospital, it may be deducted from the District's appropriation for public health, leaving a net balance of $20,107,000 in that category. Since the federal contribution to the District budget represents only one-tenth, then the federal contribution attributable to health and medical activities can be approximated at $2,000,000.

FEDERAL TRADE COMMISSION

(This Year: $1,600,000—Last Year: $1,500,000)

The Commission plans to spend about the same as last year for research, testing and compliance operations in the field of food, drugs, cosmetics and devices. This is nearly 20% of the agency's total budget of $5,975,000. FTC is charged by Congress with the safeguarding of life and health of the public through the prevention of the dissemination of false advertisements of various products.

DEPARTMENT OF COMMERCE

(This Year: $1,212,400—Last Year: $911,300)

Civil Aeronautics Administration.....$600,000
last year: $385,000

Spending for the Civil Aeronautics Administration flight safety program is divided as follows: $375,000 for salaries and administrative expenses at headquarters; $170,000 for similar expenses in regional offices; $55,000 for the CAA Medical Research Laboratory at Oklahoma City. Five full-time and four part-time medical officers in the field supervise

the periodic physical examinations required of commercial and private pilots. CAA has 1,826 designated medical examiners in the United States and overseas. A total of 225,614 examinations were made last year and a similar number are expected to be made this year. For this service, pilots pay examining physicians directly.

National Bureau of Standards.....$612,400
last year: $526,300

The Bureau of Standards performs tests and engages in developmental research on its own initiative and at the request of others. The Bureau will expend $176,800 of its own money this year as follows: $117,200 for radiation research; $43,000 for audiometric calibrations research; $16,600 for dental materials research. In addition the Bureau will receive $435,600 from other agencies, divided as follows: $71,100 for radiation research; $91,000 for air pollution research; $49,000 for instrument testing; $63,500 for anesthesiological and respiratory equipment evaluation; $93,000 for dental materials research; and $68,000 for preparation of C-14 labeled carbohydrates.

CIVIL SERVICE COMMISSION

(This Year: $426,000—Last Year: $387,000)

The Commission's total budget is approximately $18,200,000, out of which about 2.3% goes to the medical division for salaries of eight physicians in Washington and eleven in the regional offices. The medical division's duties include establishing and reviewing physical standards for all civilian jobs in the Federal Government, supervising and adjudicating disability claims for retirement, and setting professional standards of doctors and ancillary personnel to be employed in government in the competitive civil service.

PRESIDENT'S COMMITTEE FOR EMPLOYMENT OF PHYSICALLY HANDICAPPED

(This Year: $214,700—Last Year: $182,575)

Projected spending is for salaries and administration in the development and promotion of educational programs among employers and the general public to stimulate employment of qualified physically handicapped persons. It also entails expenses in connection with the National Employ the Physically Handicapped Week.

SMALL BUSINESS ADMINISTRATION

(This Year: $150,000—Last Year: $70,000)

The Small Business Administration provides financial assistance to hospitals, convalescent and nursing homes, medical and dental laboratories, and physicians for expenses, improvements and general operations. Small Business Administration loans are of two types: participation loans, those made jointly with banks and other private lending institutions; and direct loans, where no participation is available. Since all loans must be of such sound value or so secured as reasonably to assure repayments, no program losses are anticipated. SBA officials estimate that administrative expenses for the headquarters and field offices will approximate $150,000, which is about 1.5% of the total administrative fund available for all lending operations.

DEPARTMENT OF THE INTERIOR

(This Year: $140,000—Last Year: $154,950)

The Bureau of Mines, operating within the Department of the Interior, has a total appropriation of $5,585,000 for health and safety activities for this fiscal year. Identifiable health programs and expenditures are as follows: $41,000 for a program for silicosis prevention in mines; and $99,000 for studies on natural and equipment fuel gases in mines and effect of radioactivity in metal mines.

NATIONAL ADVISORY COMMITTEE TO SELECTIVE SERVICE

(This Year: $19,000—Last Year: $19,000)

In requesting this budget, which is the same as last year's appropriation, the National Advisory Committee to Selective Service was informed by the military it probably would not be necessary to make draft calls for physicians in the current fiscal year. In any event, if calls were necessary, they would be less than the level which obtained when state and territorial offices and staffs were in operation. Congress provided the $19,000 appropriation for a skeleton staff and for expenses of national advisory committee operations, plus nominal expenses of state committees which are now on a standby basis. Because it now appears that several hundred physicians will have to be called before next June 30 via the draft, additional funds will be requested when Congress convenes in 1959. The National Advisory Committee has the responsibility of advising Selective Service on deferment policies for physicians in residencies, teaching positions, essential laboratory and clinical research and re persons deemed necessary to protect civilian health at a time when draft calls are being made. The state and territorial committees assist the national committee when their services are required.

OFFICE OF THE ATTENDING PHYSICIAN OF CONGRESS

(This Year: $13,145—Last Year: $12,145)

Since 1928, the Office of the Attending Physician of Congress has provided outpatient care for members of the House and Senate and their staffs. By an act of that year, the office has been filled by a medical officer of the United States Navy. Sole occupant of the post has been Rear Admiral George W. Calver (M. C.), U. S. N. Funds voted by Congress are for medical supplies and equipment and contingent expenses. Salaries of Dr. Calver, his assisting physicians and enlisted corpsmen are paid from Navy funds.

TABLE 2.—*Payments to Individuals Because of Disability Through Programs in Which the U. S. Government Participates (fiscal year ending June 30, 1959)*

(Small groups of federal retirees' plans not listed; administrative cost of program omitted)

Programs	Estimated Beneficiaries	Approx. Payments
Veterans Benefits		
A. Service-Connected Disability	2,445,000[a]	$2,013,000,000[a]
B. Non-Service-Connected Disabilities	1,332,000[b]	1,135,000,000[b]
Military Retirement Permanent & Temporary Disability	82,000	221,840,000
Federal Employees Compensation (Payments) (These programs fully financed by U. S.)	136,500	24,835,000
Public Assistance		
A. Aid to Needy Permanently & Totally Disabled	330,000	200,300,000[c]
B. Dependent Children Aid (incapacitated father segment)	722,000[d]	235,000,000[d]
C. Aid to the Blind	108,800	90,400,000[e]
Disability Annuity Payments to Civil Service Retirees (Public Assistance financed 55% U. S. & 45% states; Civil Service financed 50% U. S. & 50% employees.)	90,000[f]	127,000,000
Social Security—OASI Disability		
A. Disability Over Age 50	362,000[g]	333,000,000
B. Childhood Disability Benefits[h]	52,000[h]	24,000,000
C. Dependents of Disabled Workers[i] (These programs financed by OASI Payroll Tax)	80,000[i]	50,000,000
Railroad Retirement Disability		
A. Permanent Disability for Regular Job	30,000	42,000,000
B. Permanent Disability for All Employment	71,000	88,000,000
C. Temporary Disability (These programs financed 50% employers—50% employees.)	150,000	50,000,000
Total	5,897,300[j]	$4,634,375,000

[a] 388,000 dependents in this total; program decreasing as beneficiaries die.

[b] 511,000 dependents in this total; program is increasing rapidly.

[c] $143.9 million of this total is provided from U. S. funds. Additional program administrative cost is about $29.8 million (11.5%); U. S. share is $14.9 million.

[d] Provided to 167,000 families. $142.8 million of benefits is federal. Additional administrative cost is $22.8 million (9.7%); U. S. share is $11.4 million.

[e] U. S. contribution to program is $45.4 million. Additional administrative cost is $6.6 million (7.3%); U. S. share is $3.3 million.

[f] Number of persons in this program increased by 11,400 over last year.

[g] 362,000 beneficiaries are estimated at mid-year; by July 1, 1959 estimate is 330,000.

[h] Eligibility based on disability incurred before age 18; the 52,000 beneficiaries listed is at mid-year; by July 1, 1959 total will reach 73,000.

[i] Does not include any childhood disability beneficiaries entitled to benefits as dependents of disabled workers; the 80,000 beneficiaries listed is at mid-year; by July 1, 1959 total will reach 134,000.

[j] No adjustment made for payments to one individual through more than one program.

MEDICAL EDUCATION IN THE UNITED STATES AND CANADA

Fifty-Eighth Annual Report on Medical Education in the United States and Canada by the Council on Medical Education and Hospitals of the American Medical Association

Edward L. Turner, M.D., Walter S. Wiggins, M.D., Glen R. Shepherd, M.D., John Hinman, M.D., and Anne Tipner

Table of Contents

	Page
Acknowledgement	1460
Fifteen Years of Growth	1460
Progress and Experimentation in Medical Education	1461
Major Developments of Interest	1461
Historical Note on the Curriculum	1461
Duke University Initiates New Program	1461
Resume of First Year of Joint Study of the University of Buffalo Schools of Medicine and Education	1461
University of Washington Faculty Teaching Conference	1466
Review of 30-Year Experiment with Preceptorships at the University of Wisconsin	1466
Western Reserve Reports on First Evaluation Studies	1467
Introductory Studies in the Sociology of Medical Education	1467
Pittsburgh Outlines Plan of Experimental Program	1467
Annual Teaching Institute of Association of American Medical Colleges	1468
Focus on Future Needs in Medical Education	1468
Challenges to Medical Education	1468
Council on Medical Education and Hospitals Supports Development of Additional Facilities for Basic Medical Education	1470
Function and Structure of a Modern School of Basic Medical Sciences	1470
Reports of Current Interest to Medical Education	1471
Cooperation in Medical Education	1471
Collaboration with the Association of American Medical Colleges	1471
Financing Medical Education	1472
The Carroll Studies on Costs of Medical Education	1472
American Medical Education Foundation	1475
National Fund for Medical Education	1476
Studies on the Internship and Residency Aspects of Medical Education	1476
National Academy of Sciences-National Research Council Study: Postdoctoral Education in the Medical Sciences and Research; A Preliminary Report	1478
Report of the Secretary's Consultants on the Advancement of Medical Research and Education through the Department of Health, Education, and Welfare	1483
Progress Report Submitted by Committee on Preparation for General Practice	1484
Second World Conference on Medical Education	1485
Initial Test of Cooperative Analysis of Problems of Mutual Concern Leads to Proposal for Permanent Liaison Between Higher Education and Organized Medicine	1486
Regional Interstate Compacts and Medical Education	1486
Southern Regional Education Board (SREB) and Medical Education	1487
Western Interstate Commission for Higher Education	1487
The New England Medical-Dental Education Program	1488
The National Society for Medical Research	1489
Medical Schools	1489
Approved and Newly Developing Medical Schools	1489
Construction of Facilities	1492
Medical School Expenditures	1493
Full-Time Faculty Positions in the United States Unfilled 1957-1958	1494
Graduate Education in the Basic Medical Sciences	1495
Teaching Responsibilities for Other than Medical Schools	1499
Supply of Anatomical Material	1502
Supply of Animal Material	1503
Medical Students	1503
Enrollments	1503
Enrollment of Women Students	1505
Geographic Source of Entering Students	1507
Attrition and Geographic Residence Restrictions	1511
College Record of First Year Medical Class	1512
Preprofessional Attainments of the Entering Class	1514
Medical Students Admitted to Advanced Standing	1515
Part-Time or Special Students	1515
Students Withdrawing for Advanced Study	1516
Attrition of Medical Students	1517
Student Expenses	1517
Scholarship and Loan Funds	1518
Student Employment Practices	1521
Graduates	1521
The Next Entering Class	1522
International Educational Exchange in Medicine	1522
Foreign Scholars Serving on United States Faculties	1522
Foreign Students (excluding Canadians) Enrolled in United States Medical Schools	1523
Foreign Physicians Training in United States Hospitals	1523
United States Faculty Members Abroad	1523
United States Students Studying Medicine Abroad	1523
The Educational Council for Foreign Medical Graduates	1524
Postgraduate Medical Education	1524
Educational Values of the Grants and Training Awards Programs of the United States Public Health Service	1525
Research Fellowships	1526
Visiting Scientist Program	1526
Training Grants	1526
Traineeships	1527
Research Grants	1527
Health Research Facilities	1528
Training for Public Health Service Careers	1528
Conferences and Seminars	1528
The National Science Foundation	1529
Basic Research	1529
Short-Term Medical Research	1529
Conferences and Symposia	1530
Fellowships	1530
Contributions of the Office of Vocational Rehabilitation to Medical Education and Research	1530
Undergraduate and Graduate Medical Training Programs in the Veterans Administration	1531
Undergraduate Medical Education	1532
Graduate Training Program	1532
Foreign Medical School Graduates	1532
Resident Compensation	1533
National Defense and Medical Education	1533
Selective Service System	1533
Status of Medical Students	1533
Status of Interns and Residents	1534
Status of Faculty Members	1534
New Legislation	1535
Army, Navy, and Air Force Procurement Programs	1536
Army	1536
Navy	1537
Air Force	1541
Medical Education for National Defense	1542
Areas Allied to Medicine	1543
Schools for Medical Record Librarians	1543
Schools for Medical Record Technicians	1544
Schools for Medical Technologists	1544
Schools for Occupational Therapists	1545
Schools for Physical Therapists	1546
Schools for X-ray Technicians	1546
Editorials	
The Purpose of a Medical School	1548
The Full-Time Faculty Deficit	1548
Balances to be Considered in International Education Exchange of Medical Students	1549

ACKNOWLEDGMENT

The material presented in the following pages constitutes the 58th Annual Report on Medical Education in the United States and Canada, compiled by the Council on Medical Education and Hospitals of the American Medical Association. This report is concerned specifically with basic medical education, certain facets of graduate education beyond medical school, postgraduate medical education, and education and training in areas allied to medicine which have requested Council cooperation and participation. Detailed information regarding postgraduate medical education is presented annually in a separate issue of THE JOURNAL (Aug. 16, 1958). Graduate medical education including internships, residencies, fellowships, and certain pertinent data regarding the specialty boards is revised annually and has been published in the Oct. 4, 1958, issue of THE JOURNAL.

The data presented cover the academic year 1957-1958 and have been derived from official sources in all instances. The basic questionnaire on which medical schools submitted their annual data for this report was prepared jointly by the Council on Medical Education and Hospitals of the American Medical Association and the Association of American Medical Colleges. Presentation of the following information has been made possible through the cooperation of medical school and university officials, representatives of government agencies, and the officials of the technical areas allied to medicine which are included.

The Council on Medical Education and Hospitals desires to express appreciation on behalf of the American Medical Association to those individuals and organizations who have cooperated in furnishing the information on which this current report is based.

TABLE 1.—*New Four-Year Medical Schools Developed in the United States and Canada During the 15-Year Period 1943-1958*

Name of Institution	Originally Founded	Four-Year Program Instituted	First Graduates of Four-Year Program
Medical College of Alabama*	1859	1943	1946
University of California at Los Angeles	1951	1951	1955
University of Miami	1952	1952	1956
University of Florida	1956	1957	1961
University of Mississippi*	1903	1955	1957
University of Missouri*	1840	1955	1957
Albert Einstein College of Medicine	1950	1955	1959
Seton Hall College of Medicine	1954	1956	1960
University of North Carolina*	1879	1952	1954
University of Puerto Rico	1949	1950	1954
University of Texas Southwestern	1943	1943	1944
University of Utah*	1905	1943	1945
University of Washington	1945	1946	1950
University of Kentucky	Currently being organized		1961(?)
West Virginia University*	1902	Four-year program under consideration	
University of Saskatchewan*	1926	1955	1957
University of Ottawa	1945	1947	1951
University of British Columbia	1950	1950	1954

* Former two-year school of basic medical science.

FIFTEEN YEARS OF GROWTH

As one reviews the passing scene and notes the dates of establishment of medical schools, the past 15 years have witnessed remarkable developments. During this period 13 additional four-year programs have been activated in the United States and three in Canada. Two other schools (Kentucky and West Virginia) are in development but have not yet implemented their new programs. Eight of these currently activated four year schools represent entirely new institutions, and all but three of them (Florida, Albert Einstein, and Seton Hall) have already been adding physicians to the ranks of the profession through graduation of one to several classes of students. The other five institutions include those which have augmented their programs during this period from former two year schools of basic medical science to four-year degree-granting schools, all of which have graduated classes.

The University of Kentucky is currently engaged in the planning and development of its four-year school but has not yet activated its teaching program. West Virginia University School of Medicine is completing its new facilities and the faculty organization involved in converting from a two-year school of basic medical science to a four-year program.

In Canada, during this period, there have been two entirely new four-year medical schools and one institution which has converted its program from two years of basic medical science to a four-year curriculum.

Table 1 lists the institutions to which reference has been made, giving the original dates of their organization and also the dates when some schools starting as two-year institutions initiated four-year programs. The accompanying photographic reproductions portray these interesting and impressive facilities which have been developed during the 15-year period. In many instances the photographs give only a partial indication of the teaching, research, and clinical facilities utilized. In presenting the photographs of these four-year institutions developed during the 15-year period, it should also be indicated that practically all of the medical schools in the United States and Canada have benefited from additions to their physical facilities during this period and that a complete photographic story of such developments would fill many additional pages.

PROGRESS AND EXPERIMENTATION IN MEDICAL EDUCATION

MAJOR DEVELOPMENTS OF INTEREST

Forty-nine of the 85 operating medical schools in the United States and 7 of the 12 Canadian schools reported major new developments during the 1957-1958 period. These included changes in administrative organization (19 United States and 2 Canadian schools), changes in methods of student selection (9 United States schools), curriculum planning and activation of modified programs (26 United States and 5 Canadian schools), and significantly augmented financial resources (37 United States and 5 Canadian schools). Augmented financial resources covered funds for construction (20 United States and 1 Canadian school), student loans and scholarships (8 United States schools), salary adjustments, maintenance, equipment, research, and basic endowment.

It is significant that during recent years the areas in which most active major changes continue to occur are in matters of curriculum analysis and modification and in the financing of the many costly facets of medical education.

HISTORICAL NOTE ON THE CURRICULUM

In connection with curriculum studies and readjustments it is of interest to recall a historical note. On April 4, 1909, the Council on Medical Education reviewed a schedule of 10 subjects with the number of hours assigned and voted to recommend this 4,100-hour program as a "working schedule for the medical curriculum." In its minutes of that date the Council specifically stated that: "It was the general opinion of those present that this schedule should not be made a hard and fast requirement to which all colleges should comply, and that a strict uniformity of curricula among all colleges was undesirable." The schedule which had been outlined represented the combined opinion of over 100 leading medical educators who had been consulted before it was finally presented.

At their meeting the next day, April 5, 1909, the Council members reviewed their actions of the previous day. Fear was expressed by certain members that some of the state examining boards would adopt the standard curriculum set forth by the Council as a guide and make it obligatory on medical colleges if their graduates were to be qualified for examination. To counteract any such possibility the following resolution was adopted:

Whereas, the object of the Council on Medical Education in appointing a Committee on Medical Curriculum was entirely educational and suggestive and,

Whereas, the impression prevails among medical teachers and members of state boards that the Council is framing a curriculum for the purpose of having it serve as a standard to which medical schools must conform or be condemned by the state authorities as not in good standing, therefore be it

Resolved, that every publication of a curriculum that hereafter may be made by the Council, its members, or its officers as such, shall state explicitly that the Council does not consider it in the interest of true progress in education that any standard curriculum whatever shall be uniformly adopted by all medical colleges.

DUKE UNIVERSITY INITIATES NEW PROGRAM

Among the developments of interest to medical education is the recent announcement of plans for a major educational program at Duke University, designed to produce physicians who are also skilled medical research scientists. As presented, the program is planned with the objective of training medical students and hospital resident physicians in the methodology and utilization of research tools and techniques. It is reported that the financial support for the first three years of operation will come from grants totaling over three quarters of a million dollars. Of this sum, approximately $500,000 will be utilized in the provision of quarters and equipment with the balance allocated for salaries and maintenance. The program will be housed in a new four-story addition to the Bell Medical Research Building at the Duke Medical Center. Construction was initiated during the summer of 1958, and it is planned to admit the first class of research students in July, 1959. The faculty will include six full-time teacher-investigators who will become members of the medical center staff. As currently envisioned, the program will be geared to train about 20 students, who will integrate the research training with their regular four-year medical school curriculum. Included also will be house staff physicians, a small number of Ph.D. candidates in the basic medical science departments and in nonmedical sciences. Student selection will be based largely on "evidence of a research bent of an inquiring, critical and original mind," and Duke students will be given priority consideration. The announcement indicated that the individuals composing the planning committee for this program include Dr. Eugene A. Stead Jr., Chairman, Department of Medicine; Norman F. Conant, Ph.D., Professor of Mycology; Dr. David T. Smith, Chairman, Department of Microbiology; and Dr. Joseph E. Markee, Ph.D., Chairman, Department of Anatomy.

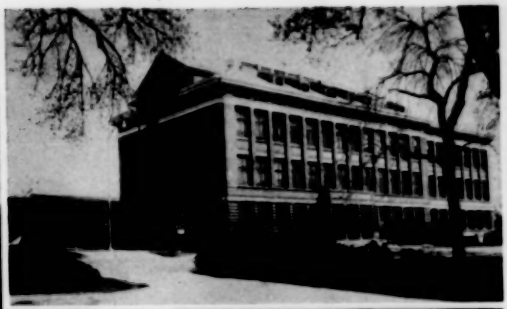
RESUME OF FIRST YEAR OF JOINT STUDY OF THE UNIVERSITY OF BUFFALO SCHOOLS OF MEDICINE AND EDUCATION

The University of Buffalo School of Medicine has completed the first phase of a joint study with the School of Education to determine whether the instructional program in a medical school might be strengthened by the development among medical teachers of greater familiarity with educational principles and techniques. The first year of the investigation was devoted to an examination of current medical teaching practices by professionals

Below, University of Miami School of Medicine, Basic Sciences Building, Coral Gables.

Above, University of North Carolina Medical Center, Chapel Hill.

Right, University of Washington School of Medicine, Seattle. *Below*, University of Saskatchewan College of Medicine, Saskatoon, Saskatchewan, Canada.



Above, Jersey City Medical Center and Seton Hall College of Medicine and Dentistry. *Above right*, University of Utah College of Medicine, Salt Lake City. *Center right*, Albert Einstein Medical Center, New York City. *Below*, University of Puerto Rico School of Medicine, San Juan.

Left, University of Florida College of Medicine, Gainesville.

Right, University of California School of Medicine, Los Angeles. *Below*, University of British Columbia Faculty of Medicine, Vancouver, British Columbia, Canada.

Below, Medical Center of University of Alabama, Birmingham.

Above, University of Missouri School of Medicine, Columbia. *Left*, University of Mississippi School of Medicine, Jackson.

Right, University of Ottawa Faculty of Medicine, Ottawa, Ontario, Canada.

Left, University of Texas Southwestern Medical School, Dallas.

in education under the guidance of medical faculty members. During the next two years an intensive series of seminars and workshops were conducted jointly by the educational specialists and their opposite numbers in medicine for a small group of medical teachers who gave nearly half time for a full academic year to these studies. The topics which occupied them included the psychodynamics of the learning process and the influence which teaching exerts upon it; the nature of the medical student population and the influence of personal and environmental factors in the student body and faculty upon learning; the historical and philosophical background of higher education as it relates to medical education; and the materials and methods of instruction in a medical school and evaluation of student progress.

The project coordinator has reported that the thirteen medical teachers, representing the University of Buffalo and six other medical schools, who have now taken part in the program, are agreed that professionals in education can make an important contribution to education in medicine. An independent evaluation of the effect of the program upon participants confirmed the impression that both their attitudes and practices had been modified by the experience. The data accumulated during two years of seminars made it possible to identify those items in education which had the greatest impact upon the participating teachers. This information is now being used in the construction of a second phase in this joint project which will have as its objective the provision of a more realistic opportunity for medical teachers to engage in a concentrated period of study of educational principles and techniques in a medical context. The first of a series of two-week institutes on medical teaching was held in June under the joint sponsorship of the University and the Association of American Medical Colleges. It was attended by 25 representatives of 20 medical schools in the United States and Canada. It will be repeated once or twice in the 1958-1959 academic year and at intervals thereafter. In addition to the institutes which provide an opportunity for teachers in other medical schools to share this experience, a continuing series of seminars will be held for the Buffalo faculty.

This program is supported by the Commonwealth Fund.

UNIVERSITY OF WASHINGTON FACULTY TEACHING CONFERENCE

In September, 1957, the University of Washington medical faculty held a two-day conference on teaching in the clinical years. The entire faculty, basic science and clinical department members included, heard reports from some of their own colleagues who had visited outstanding teaching programs at other medical schools. The pros and cons of these programs and the possibility of utilizing certain of their advantageous aspects in whole or in part were thoroughly discussed. This conference was part of a study of patient care and teaching made possible by a grant from the Commonwealth Fund. The fourth of these annual conferences to be held by this faculty was scheduled for September, 1958, and was intended to focus attention on teaching of basic sciences during the clinical years.

REVIEW OF 30-YEAR EXPERIMENT WITH PRECEPTORSHIPS AT THE UNIVERSITY OF WISCONSIN

It is desirable on occasion for an institution to evaluate carefully the program innovations and curriculum modifications which have been made with specific objectives toward improvement of its medical education potentialities. The University of Wisconsin has reported its 30-Year Experiment in Medical Education through the medium of the Wisconsin Preceptor Program. As reported by Bowers and Parkin,[1] the students are enthusiastic over the program and apparently look forward to it as one of the high points of their medical school career. The students who spend 12 weeks out of the 48-week senior year in this program express the belief that this allocation of time for the preceptorship should not be reduced. Those students who have completed the experience indicate that its greatest benefit was the opportunity to see the acute disease problems which they do not encounter frequently at the University Hospital. They also find that their patient relationships are more intimate, penetrating, and more satisfactory as they make the initial contact with them rather than after the various preliminary admitting procedures involved with the patients at the teaching hospital. They have more opportunity to see the patient's family and to understand the total problem as well as to learn how to more effectively talk with patients. The experience with a preceptor sometimes helps to determine the field of medicine that the student decides he does not wish to enter as well as suggesting a possible major field of interest.

Bowers and Parkin indicate a few of the debits that have accompanied the plan. For instance, some students conceive of the preceptorship as an opportunity to prepare for internship. In some situations students see too many patients during the day and develop a tendency to utilize short cuts in their evaluations of individual patient problems. In other instances the student may be allowed to be too much on his own. Some students find they work harder during the preceptorship than during any other phase of their medical education and that there is inadequate opportunity for follow-up study.

Page and Anast,[2] in summarizing an alumni evaluation of this 30-year program, found that those who looked back on their participation in it as part

of medical education were generally enthusiastic. It was considered to afford a close teacher-student relationship that had been of genuine value. The study could present no evidence that this preceptor program had acted to encourage graduates to enter the field of general practice or to settle in rural areas. On the contrary, it was of interest to note that the study revealed evidence that graduates of Wisconsin enter specialty practice with as great or greater frequency than the alumni of comparable medical schools which have not included preceptorships in their programs.

WESTERN RESERVE REPORTS ON FIRST EVALUATION STUDIES

It is now 12 years since the faculty of the School of Medicine at Western Reserve University initiated the planning of the program of medical education which was activated in 1952. The new program at Western Reserve was an outgrowth of growing dissatisfaction with existing programs and the conviction that the education of physicians could be improved in a number of ways. As the program developed the faculty has been confronted by questions as to whether it is possible to evaluate it effectively in a way as to provide meaningful results. There has been continuing critical study of the program by a subcommittee on evaluation which was established in 1953 and which has endeavored to develop a broad concept for research in medical education. Dingle and associates [3] have recently outlined the approach to the problem of evaluation and indicated the fields in which their studies are being done. They have suggested the need for suitable evaluation of any program in medical education, and their experience to date has emphasized some of the difficulties inherent in any such effort. Their studies have shown that research in medical education appears to be as greatly needed as it is in other fields of endeavor. In fact, it is suggested that consideration be given to establishing, at the school, an adequately staffed division of education research with the primary concern of (1) evaluation of the effectiveness of the program in relation to objectives and in relation to standards of contemporary medical education; (2) research in student development; (3) research in teaching methods; (4) research in testing methods; and (5) training of investigators in educational research.

The first report of the Western Reserve studies has been presented by Horowitz, Brozgal, and Eaton [4] and deals with observations of first-year students in preceptoral groups. This report presented observations of the reactions of first-year medical students in preceptoral groups in a clinical science program and, to a limited degree, described the behavior of their preceptors. It is recognized that full evaluation of the effectiveness of a program such as that being conducted at Western Reserve University will not be possible until a considerably longer period of "follow-through" has elapsed. This first report, however, presents some important challenging observations which merit careful study on the part of those concerned with ways and means of improving medical education. While the study reports only part of the over-all program, it records observations of positive value that may well be utilized in part by other institutions pursuing experimental reorientation of the early phases of the medical curriculum.

INTRODUCTORY STUDIES IN THE SOCIOLOGY OF MEDICAL EDUCATION

Another valuable contribution in the field of medical education was the publication of the Introductory Studies in the Sociology of Medical Education. In this volume, Merton, Reader, and Kendall,[5] present a collection of papers constituting the first set of reports on continuing studies in the sociology of medical education which were begun several years ago by the Bureau of Applied Social Research of Columbia University. This study was conducted in collaboration with the students and faculties of the Schools of Medicine of Cornell University, University of Pennsylvania, and Western Reserve University. These introductory presentations are apparently intended to be part of a periodic series of reports of special studies in the sociology of medical education which will extend over a number of years before any final comprehensive synthesis will be attempted. Eventually the studies will include the sociological evaluation of graduate medical education which is discussed elsewhere in this current education number of THE JOURNAL.

In its initial section this first report deals with a thought-provoking section on preliminaries to a sociology of medical education, and a resume of the Cornell Comprehensive Care and Teaching Program. The second section is concerned with career decisions such as the decision to study medicine, some comparisons of medical and law school entrants, and tendencies toward specialization in medical training. The third section discusses the processes of attitudinal learning and the final portion of the report presents changes in the Cornell Care and Teaching Program and the range of patient contacts in it. Again, this report brings together in better focus certain aspects of an experimental program in medical education that has been underway for a number of years, presenting data of value to other institutions considering curriculum realignment.

PITTSBURGH OUTLINES PLAN OF EXPERIMENTAL PROGRAM

Moses, Gregg, and Danowski [6] have presented an outline of an experimental curriculum of medical education for modern medicine which is being de-

veloped at the University of Pittsburgh. It is designed to permit a small number of students greater flexibility in their college and medical educational experience. The program as suggested would permit those students deeply interested in a scientific career in a medical field to pursue a course more appropriately designed to such an objective. Likewise, it would make it possible for the students primarily interested in becoming family physicians or clinical specialists to participate in educational experiences designed toward such ends. Both scientific and humanistic aspects of the program would be strengthened to permit potential scientists and clinical specialists to initiate the specialized phases of their education at an earlier date. Furthermore, it is believed the curriculum of students electing the clinical practice of medicine will provide a more effective educational experience than the current all-purpose, 9-year course.

At the beginning it is planned to select a small group of students on the basis of their early collegiate experience and permit them to take some of their courses along with regular medical students. Subsequently, the curriculum of these students will be modified in accord with their interests and abilities so as to provide both a sound general education and a more effective basis for their ultimate career objective. This would be accomplished through the judicious utilization of summer periods and reorienting of students through the current departmental structure to provide the most effective individual objective. The individualization required by such a program will necessitate careful and exacting counsel and guidance and will be interesting to observe in action.

ANNUAL TEACHING INSTITUTE OF ASSOCIATION OF AMERICAN MEDICAL COLLEGES

The 1957 Teaching Institute of the Association of American Medical Colleges, held in Atlantic City, Oct. 16-19, focused attention on the ecology of the medical student. This was the second successive institute which was primarily student-centered, the preceding one having dealt with the appraisal of applicants to medical schools. The major areas considered included (*a*) the various intramural forces affecting medical students; (*b*) the diversity of values and objectives in medical education; (*c*) noncurricular factors affecting medical students; (*d*) the development of professional attitudes and capacities; and (*e*) educational patterns for medicine. The 1957 Teaching Institute stimulated further interesting and critical self-appraisal and intercommunication in regard to the student in the process of medical education.

The 1958 Institute conducted at Swampscott, Mass., Oct. 7-11, was the first of the institutes dealing with clinical teaching. Many individuals in medical education have been awaiting with interest and anticipation the first of the clinical teaching institutes. This institute dealt with such areas as (*a*) objectives of clinical teaching and (*b*) the variation of emphasis in objectives such as (1) the case for emphasis on the practical and encyclopedic, (2) the case for emphasis on social forces and environment, (3) the case for emphasis on scientific method, (4) "The Science, the Art and the Heart; A Synthesis of Objectives in Clinical Teaching"; and (5) the extramural forces influencing medical education from the point of view of the philosopher, the economist, and the behavioral scientist. It also dealt with the setting of clinical teaching including medical service in the teaching hospital, the relationships of a university to a teaching hospital, and hospitals and clinical teaching. The third general topic centered on the student, the patient, and the teacher and covered considerations of the clinical teacher and scholarship as the heart of the educational process. It also considered student participation in the teaching process, patient care as a social process, and a presentation of clinical teaching in the European system of medical education.

There is no question but that the previous institutes sponsored by the Association of American Medical Colleges have led to markedly enhanced intercommunication between medical faculties throughout the nation as well as within the schools themselves. The follow-through from the 1958 institute promises to continue in the further stimulation of this desirable trend.

FOCUS ON FUTURE NEEDS IN MEDICAL EDUCATION

CHALLENGES TO MEDICAL EDUCATION

At the 54th Congress on Medical Education and Licensure held in Chicago, Feb. 9-11, 1958, attention was focused on the challenges and future needs in medical education. The reasoning behind and the purpose of this Congress was presented by Dr. Leland S. McKittrick,[1] Chairman of the Council on Medical Education and Hospitals, by posing the question: "Are those responsible for supplying medical needs to the people in this country aware of what these needs will be in the forseeable future, say in the next 15 to 20 years; and are proper and effective efforts being made to meet them?" Doctor McKittrick indicated the emphasis that had been placed on physician-population ratios and raised a second question as to whether the answer to this situation was as simple as the production of new physicians in proportion to the increase in population.

Addressing the Congress as President of the American Medical Association, Dr. David B. Allman[2] indicated that: "changes affecting every aspect of human life are occurring at an ever accelerating rate" and that "they have presented new problems and challenges to medicine and its allies as well as to other areas of activity." These changes have been reflected by "sincere concern in regard

to the education, training, and development of the personnel needed to meet and solve effectively the problems with which they will be challenged."

Dr. Allman further commented:

It is not surprising that, with the current widespread interest in health, this changing scene has been accompanied by representation from various sources of increased needs for medical and allied personnel. No one will deny that, as our population grows at a rate far beyond estimates of a few decades ago, as health consciousness continues to grow, and as new problems arise, there will be continuing need for increased numbers of well trained medical personnel. This will necessitate the facilities, finances and faculty essential to their education and training.

He reflected the concern of other thoughtful individuals:

In the current complex setting it is not possible to plan for medical personnel needs in simple arithmetical physician-population ratios as might have been the case in earlier years. One fact, clearly certain, is that efforts to compare unqualified statistics for physician-population ratios in recent years with those early in the century is not only meaningless, but actually misleading.

Dr. Allman pointed out, as has the Council on Medical Education and Hospitals on previous occasions,[9] that the question as to "How many doctors are enough?" has become increasingly difficult to answer. Such a reply necessitates a detailed knowledge of trends in medicine and medical practice as well as efforts to forecast further population growth and shifts, continued social and economic readjustments, and the constantly increasing dimensions of scientific knowledge.

Because of its direct relation to the theme of this section of the 58th Annual Report on Medical Education in the United States and Canada, the final paragraphs of Dr. Allman's address are quoted in full.

American medicine is deeply and sincerely interested in the future education and training of the nation's physicians. It has a right to be proud of the responsible role its Association, in cooperation with other organizations, has played in the development of the high standards of medical education and medical care which exist in the United States today. If we are to maintain high standards and play our role of responsibility in the fulfillment of the needs that lie ahead, American medicine must objectively look at current trends in population, society, economy, and at the vastly changing dimensions of knowledge within its own field in an effort to clearly define some of the questions to which answers must be found.

Today danger confronts our civilization, but opportunities greater than any existing before are also present. Opportunity can be lost if responsibility is side-stepped. One may not be responsible for something that happens when his eyes are shut; but even so, he may eventually be called to account for having his eyes closed at the very moment when they should have been wide open and alert.

We in American medicine must carry our responsibility in objectively and constructively playing our role to assist in defining as clearly as possible the questions concerning future needs for the education and training of physicians. "Responsibility," it is said, "walks hand-in-hand with capacity and power," and the manner in which it is utilized can be the determinant of any individual or group's contribution to his fellow men.

Norman Cousins has recently stated: "What the Nation needs today even more than scientists is men of wisdom and vision. It urgently needs men with the clear and full view, men who understand what is happening in the world and are not continually being taken by surprise by living history and the effects of recognizable causes."

The subsequent presentations of Kirk,[10] Parsons,[11] Kestnbaum,[12] and Hussey,[13] clearly and succinctly portrayed to the Congress the current trends and challenges of the changing characteristics of our population, society, economy, and the changing dimensions of medical knowledge. Each of these four areas was carefully considered by workshop groups who subsequently reported their conclusions to the Congress. These basic challenging background presentations and the workshop resumes appeared in the May 3, 1958, issue of THE JOURNAL and merit careful study on the part of all individuals interested in any or all aspects of this matter of projection of estimated needs in the field of medical education.

The Congress also focused attention on some of the problems in specialty training resulting from the changing status of the patient. The background for this study was portrayed by Dr. Ward Darley,[14] Executive Director of the Association of American Medical Colleges, who pointed up the problems in undergraduate medical education associated with the changing status of the patient as well as some of the other specific challenges confronting this field in the area of financing and faculty policies. The specific challenge on problems in specialty training created by the changing status of patients was presented by Dr. T. Stewart Hamilton.[15] Zintel,[16] Williams,[17] Lawson,[18] and Barnes[19] outlined the manner in which surgery, medicine, pediatrics, and obstetrics and gynecology may meet some of these problems in graduate medical education. Burgess and Leonard,[20] presented the manner in which the community hospital may play an important and significant role in graduate medical education today.

The 55th Congress on Medical Education and Licensure scheduled for Feb. 8-10, 1959, will focus attention on the areas of specialism and research. The role of research in relation to medical education has become increasingly important over the years and now presents many facets that merit serious study as plans are developed for new medical schools and for progressive realignment of activities in those currently in existence. How can medical education and medical research be further developed to their best mutual advantage? Where is mutual advantage lost in the more direct interests of either education or research? How can research best contribute to medical education, and how does medical education strengthen research activities? These and many other questions of deep interest and concern to medical educators, those engaged in higher education in areas other than

medicine but having potential contributions to it, hospital administrators, and those concerned with current specialty education and training should make this program one of very real interest. Some of the current trends in specialization have likewise given cause for careful scrutiny. The trend towards increasing inflexibility in some specialty areas, the means of evaluation of residency and other forms of specialty training, the emphasis on time as a measure of adequacy of training, the problems involved in evaluation of quality and content of education and training in the specialties, the specialty boards, the Advisory Board for Medical Specialties, and the residency review and conference committees will all enter into the considerations to be given to this area of medical education.

COUNCIL ON MEDICAL EDUCATION AND HOSPITALS SUPPORTS DEVELOPMENT OF ADDITIONAL FACILITIES FOR BASIC MEDICAL EDUCATION

The 1956-1957 Annual Report on Medical Education in the United States and Canada [21] included a statement on the future need for physicians which had been prepared by the Association of American Medical Colleges. The Council on Medical Education and Hospitals [22] has previously indicated the existence of the challenges in this field presented by the increasing population, rapid accumulation of scientific knowledge applicable to medicine, and the changing social and economic facets of the American scene. The Council on Medical Education and Hospitals as is indicated in the following statement supports its own previous comments and those of the Association of American Medical Colleges as to the desirability of developing additional facilities for medical education.

Through the medium of its various activities and particularly in its Annual Report on Medical Education in the United States and Canada, the Council on Medical Education and Hospitals of the American Medical Association has endeavored to present and interpret the changing scene in medical education to the profession. With the support of the medical profession and in cooperation with the Association of American Medical Colleges, the American College of Surgeons, the American College of Physicians, the various specialty boards, the Joint Commission on Accreditation of Hospitals, the American Hospital Association, and other organizations, constant and sincere efforts have been made to assist in the advancement of medical education in keeping with the knowledge, trends, and needs of the period.

In recent years the position of the American Medical Association in regard to present and future needs in medical education has frequently been misinterpreted by many individuals and by some organizations through the misuse of statistical data. Statistical information has at times been taken out of context and interpreted to the effect that the official position of the American Medical Association is that there is no need for increased numbers of physicians. No such official position has ever been enunciated. American medicine, as was indicated earlier in this report in reference to Dr. Allman's comments at the 54th Congress on Medical Education and Licensure, fully recognizes the needs being brought about by the increasing population, social and economic trends, and the changing dimensions of medical knowledge and its application. The primary concern of American medicine is that these needs be carefully analyzed and that they be met as a result of sound developments based on the best possible knowledge.

The Council on Medical Education and Hospitals recognizes that the physician-population ratios, on which most current projections of medical personnel have been made, have remained relatively constant for a number of years. It is difficult, however, in the rapidly changing modern scene, to determine whether this relative ratio of physicians per unit of population might be reduced or should be augmented to meet the medical care, teaching, and research challenges of the future. On the other hand, the increasing population together with the various other facets of the shifting pattern obviously indicate the need for constantly increasing the number of physicians. This necessitates consideration on the part of existing medical schools as to possible augmentation of the number of students admitted as well as the development of new facilities. Furthermore, the Council believes it is a logical function and responsibility of American medicine to encourage institutions of higher education where medical education has not been undertaken in the past to give serious consideration to the development of opportunities in this field if all other factors make it appear desirable to do so. The Council on Medical Education and Hospitals sincerely believes it is a responsibility of the American Medical Association to take effective leadership in presenting these increased needs as objectively as possible.

The Council on Medical Education and Hospitals and the Association of American Medical Colleges, independently and through the Liaison Committee on Medical Education, are on record in encouraging the consideration and creation of both four-year programs of medical education and of two-year programs of basic medical science, where institutions of higher education offer the setting which would make such developments mutually advantageous and desirable.

FUNCTIONS AND STRUCTURE OF A MODERN SCHOOL OF BASIC MEDICAL SCIENCES

Because of interest in the contribution to medical education that might be made through the development of thoroughly excellent, additional two-year Basic Medical Science programs, the Council on Medical Education and Hospitals of the Amer-

ican Medical Association, and the Executive Council of the Association of American Medical Colleges have collaborated in preparation of a document or guide outlining their essential features. This statement entitled "Functions and Structure of a Modern School of Basic Medical Sciences" has been approved by the two Councils, and the Liaison Committee on Medical Education subsequently endorsed it.

The general format of this document follows that of the collaborative statement on "Functions and Structure of a Modern Medical School" which was published recently to replace the former "Essentials of an Acceptable Medical School." After presentation to and approval by the House of Delegates of the American Medical Association and by the Association of American Medical Colleges at their next meetings (A.A.M.C., October, 1958; A.M.A., December, 1958), the statement will be published for distribution as early as possible.

REPORTS OF CURRENT INTEREST TO MEDICAL EDUCATION

COOPERATION IN MEDICAL EDUCATION

The 1957-1958 Report of the Council on Medical Education and Hospitals to the House of Delegates of the American Medical Association includes the following comments concerning cooperation in Medical Education.

In 1942, after consultation with, and approval by the Board of Trustees, the Council developed an official working relationship with the Association of American Medical Colleges, the official organization of the medical schools, through the establishment of a Liaison Committee on Medical Education. Through this arrangement, it has been possible to share responsibilities, problems, challenges, and viewpoints in the many areas where the Council and the Association of American Medical Colleges have mutual concern and similar objectives.

The effectiveness and productiveness of this liaison has resulted in the development of somewhat similar working relationships with appropriate organizations in other fields of concern to the Council. The responsibilities and objectives in graduate medical education and specialty training clearly overlap with those of the Advisory Board for Medical Specialties and with the individual specialty boards. This field of mutual endeavor now has formal expression through a Liaison Committee with the Advisory Board and through the various residency review committees. Similarly, the Internship Review Committee was formed to give other organizations that have a legitimate stake in the internship (e. g., the American Academy of General Practice, the Association of American Medical Colleges, American Hospital Association, and the Federation of State Medical Boards) an opportunity to share viewpoints and efforts in this part of the Council's activities.

There are many other effective working partnerships now in existence and, at the present time, with the concurrence of the Board of Trustees, planning is underway to establish a liaison committee consisting of representative of the Board of Trustees, the Council on Medical Education and Hospitals, University Presidents, and the Association of American Medical Colleges. It is believed that this holds great promise for future better understanding and relationships on the part of organized medicine and its agent in medical education, the Council on Medical Education and Hospitals, with universities, who are ultimately responsible for the conduct of medical schools, and the Association of American Medical Colleges, which can be considered as the universities' agent in medical education.

The Council is of the sincere belief, based now on many years of direct experience, that this approach of cooperation and collaboration has worked to the distinct benefit of the Council's major objective as charged by the House of Delegates many years ago to "make suggestions as to the means and methods by which the American Medical Association may best influence favorably medical education' and to 'act as the agent of the American Medical Association (under instructions from the House of Delegates) in its efforts to elevate medical education."

COLLABORATION WITH THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES

In cooperation with the Association of American Medical Colleges, the Council on Medical Education and Hospitals has prepared a number of important basic documents dealing with matters of concern in medical education. The former "Essentials of an Acceptable Medical School" prepared by the Council and authorized for publication by the House of Delegates of the American Medical Association has been replaced by "Functions and Structure of a Modern Medical School," representing the combined efforts of both groups. It was approved by the House of Delegates of the American Medical Association in June, 1957, by the Association of American Medical Colleges in October, 1957, and published in late fall of 1957.

On June 1, 1958, the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges authorized and published a statement on "The Present and Future Status of Foreign Medical School Credentials in the United States." This statement includes informative data on the Educational Council for Foreign Medical Graduates, the present and future status of the list of foreign medical schools, the present and future status of graduates of foreign medical schools seeking internship and residency training in the United States under the Exchange-Visitor Program, and those entering the United States on permanent (immigration) visas. It also includes information on the status of American citizens studying medicine outside the United States and Canada, the policy of the American Hospital Association concerning graduates of foreign medical schools, and the policy of the National Intern Matching Program in regard to such individuals.

For many years the Council on Medical Education and Hospitals has sent out an annual questionnaire to each medical school in the United States and Canada for information on which the data in the education number of THE JOURNAL have been based. In order to overcome needless duplications and to obtain identical and more comprehensive information for the Council on Medical Education and Hospitals and for the Association

of American Medical Colleges, this year the annual questionnaire has been developed as a collaborative effort.

In these and many other areas there has been excellent liaison between the American Medical Association and the Association of American Medical Colleges. The "top level" liaison mechanism which will include representation from University Presidents and the Association of American Medical Colleges, on the one hand, and the Board of Trustees of the American Medical Association and the Council on Medical Education and Hospitals, on the other hand, holds great promise in the future for the discussion of problems of mutual concern. It should result in minimizing areas of difficulty and misunderstanding such as have been precipitated during recent years by the changing character of medical practice, the changing status of the patient, and the changing character of the faculties of medical schools.

FINANCING MEDICAL EDUCATION

THE CARROLL STUDIES ON COSTS OF MEDICAL EDUCATION

There is a continuing interest in relating medical school operating expenditures to the functions the expenditures support. Mr. A. J. Carroll, Business Officer of the State University of New York, Upstate Medical Center, on request, submitted the following statement pertinent to this important matter.

Medical education today faces serious financial problems. However, we can be sure that if they are reported efficiently they will get wide attention and be dealt with efficiently. For the most part, failures and delays in coping with these problems have been the result of inadequate financial reports.

The people of this country want, and will always demand, the best in medical care. They have established standards of excellence for health care, and by so doing they have set the standards for medical research and for their hospitals, doctors, and medical colleges.

For all branches of medicine the fountainhead of quality is medical education; anything that affects medical education will also affect medical research, medical practice, and medical care. Consequently, the problems of medical education are important not only to educators but to those in the health professions and to the general public.

To attain and maintain high standards a medical college needs money. An adequate supply of money will not guarantee a high level of operation by a medical college, but if there is a lack of sufficient funds over an extended period, substandard operations and results will be inevitable. Despite the large amounts of money which have been provided to the medical colleges, it can be stated categorically that their financial support has been inadequate; that the over-all quality of medical education has been adversely affected by this inadequacy; that the standards of medical care, as set by the American public, have not been fully met; and, that this failure to meet standards will grow gradually worse until more adequate support is provided.

While medical education holds the key which can give or deny the best of medical care to the American public, less than 1% of the nation's bill for medical care is being spent for medical education. This is seed money, the smallest but most productive portion of the total medical care bill. Buying anything but the best in this area would not only be uneconomical and unwise, it would endanger the health and security of our nation.

Importance of Financial Reports: We can be sure that the American public wants, and will pay for, the best in medical care, but we can be equally sure that they will insist on getting full value for their money. Therefore, it is essential that their concepts of full value be based on a clear understanding of the vital relationship between medical care and medical education. The amounts needed for medical education may appear small compared with the total costs of medical care but they loom large indeed when compared with the costs of other educational programs.

Educators, doctors, students, health personnel, legislators, government officials, university officials, and the general public—all are confused about medical education, what it costs, what it means to them, what they are paying for it, and what they should be paying.

They are confused because few medical colleges have reported costs and financial data that can be appropriately compared with those of other medical colleges, why its costs are more or less than those of other colleges, the actual cost of educating a doctor, the cost of each instructional, research, and service program, and by whom and to what extent each of these programs is supported.

Without this kind of financial information how can a medical college appraise the efficiency of its own administrative practices and policies? How can it prove that each dollar entrusted to it is being used efficiently, substantiate its proposals for improvements, and know to whom it most appropriately might look for additional support? How can it benefit most from the experiences of others? Without such information, those upon whom the colleges depend for financial and moral support will remain confused and will be seriously handicapped in their efforts to provide the colleges with sufficient operating funds.

Inadequacy of Medical College Financial Reports: The foregoing does not imply that medical colleges do not keep books or prepare financial reports. Every college reports its income and expenditures, but the reports have been misleading. Recent studies have shown that the basic reason for this is the complete lack of uniformity in med-

ical college budgeting, accounting, and reporting policies, practices, and terminology. As a result, the "costs" reported by each college reflect entirely different combinations of university, medical center, and medical college activities and expenses. Such costs are not suitable for comparisons.

Income reports have been defective because medical college "income" has not been precisely defined. For example, some colleges report tuition receipts as medical college "income" even though they are deposited in the general funds of the university or state and cannot be used for the support of college programs. For colleges that follow this practice, tuition represents "earnings" but not "income." Colleges may report state budget appropriations or university general fund budget allocations as "income" while in reality only the portion of these appropriations that is spent benefits the colleges and is the equivalent of "income." Often the unspent balance remains in, or reverts to, the university or state general funds. If a medical college retains the unspent balance, the entire appropriation or allocation should be reported as "income." However, if these unspent amounts are reappropriated for the following year, they should not be reported again as "income." In response to questionnaires some medical colleges have reported the same money as income in two or more successive years. Where these illustrations apply, income may be overstated, possibly to the detriment of the college.

Financial support for the medical college which comes indirectly through the university, hospitals, special funds, or other agencies seldom is reflected in the "income" report. In such cases "income" and "sources of financial support" are not the same.

For these and other reasons medical college "income" reports have been indefinite and have had limited significance for comparative purposes. To provide appropriate comparisons, reports of the "sources and amounts of financial support for medical college programs" are necessary. Obviously, all such reports should be prepared in accordance with uniform practices, and the terminology should be defined precisely.

Most medical colleges report their "expenditures" as "costs," and cost reports, for the most part, have been budget reports—the amounts actually spent under the medical college budget. The trouble is that the "expenditures" of a college seldom represent the true "costs" of medical college operations —the actual values that are being sacrificed to support the medical college programs.

The university may contribute a variety of business, plant, library, and student services and expenses; hospitals, clinics, special funds, and other organizations may pay faculty salaries or contribute essential facilities and supplies for the support of activities or functions common to all medical colleges. Medical college "costs," to be useful and comparative, must include these values, even if they are not charged to the medical college budget. Suppose, on the other hand, that the "expenditures" of a medical college include support of activities and programs that normally would not be charged to a medical college. To produce comparative "costs" these expenses must be identified, set aside, and excluded from "medical college costs." In other words "medical college costs," to be appropriately compared, must reflect the total costs of an identical combination of medical college programs and activities—the programs and activities common to all medical colleges.

Despite the complicated programs, responsibilities, and relationships which make medical education unique in comparison with other university and government activities, there have been continuous attempts to fit medical colleges into the normal management patterns of colleges, universities, and states. Not enough thought and effort has been applied to the special problems of the medical colleges. To illustrate this, let the medical college administrators ask themselves, "What is our accounting accounting for?"

For years the medical colleges have been telling those responsible for approving and supporting their programs *how* they have spent their money—the salaries and expenses they have paid and the things that they have bought. This is useful information for day-to-day management purposes, but trustees, legislators, and many others draw dubious comfort from reports which place major emphasis on the colleges' success in spending hard-to-get funds. They would rather be told what they are getting for their money.

This calls for program accounting and reports to show the costs of undergraduate education, graduate education for advanced degrees, intern and resident training, continuation education, medical research, community health services, patient services, etc. These are the programs for which a medical college is primarily responsible. To tell what it has done, what it is doing, and what it plans to do, a college must report in terms of these programs; and such reports, to be meaningful, must be expressed in dollars, the language of business.

With program costs, figures are supported by related facts, the cost of educating a doctor can be reported, and the common but improper method of determining per-student costs by dividing total medical college costs by the undergraduate enrollment can be discarded. With program costs a financial profit or loss figure can be determined for each college program. By carefully relating program costs and the sources and amounts of financial support, a medical college can tell the extent to which

various persons, organizations, or segments of the general public are benefiting from its operations and so will know to whom it can justifiably look for additional financial support.

This is financial reporting for everyone because it tells everyone what he is getting for his money; it presents a comprehensive, nontechnical picture of medical education. Program accounting and reporting also will be used extensively for future planning, for budget justifications, and as a check on over-all operations. It is a once-a-year procedure and, therefore, inexpensive.

For these things alone, program accounting will be justified. It should be understood, however, that it cannot replace the customary, detailed object-of-expenditure type of accounting for day-to-day budgetary control.

In this country management generally has accepted the Whitehead philosophy that a fact in isolation is of little significance. So few persons would question the desirability and the need for comparing cost and financial data that a lengthy justification of efforts to produce comparative data is not necessary. The principal reasons are the following. 1. Through appropriate comparisons one college can benefit from the experience of others and avoid unnecessary experimenting. 2. Reliable comparative data will be essential for the planning of new medical colleges and the expansion, enlargement, and improvement of those now in existence. 3. Comparative information will make it easier for those responsible for medical education to evaluate the programs and financial needs of medical colleges. In the past the lack of such data has resulted in inaccurate evaluations and inadequate financial support. 4. Quantitative reports, comparisons, and analyses are more meaningful to the general public and will influence public opinion more than individual reports would. 5. Granting agencies and foundations need quantitative and comparative financial data to determine the relative needs of individual colleges, to serve as guides for policy making, and to help them make equitable distributions of available funds.

Cost comparisons are inevitable. If those directly responsible for medical education do not make them, others will do it for them. When others do it, the comparisons will usually be made on the basis of incomplete facts and figures and will be inappropriate, dangerous, and harmful.

At this point, one might well ask: What has been done to improve medical college financial reporting? Why hasn't budgeting, accounting, and reporting uniformity been established? Why aren't program costs in common use?

For several years the need for more meaningful financial reporting has been recognized at all levels of management. Financial studies have been made, and several of them have produced ideas which with proper support and application could have led to improved reporting and uniform financial practices. However, the necessary support and cooperation did not develop and the potential long range benefits of several good studies were lost.

The colleges have told about their complex programs and have explained how these programs are so intermingled that they cannot be separated, that it is impossible to distinguish the cost of educating a doctor, the cost of research conducted by the college, etc. That these explanations have been accepted year after year without serious challenge is a tribute to the faith of the American public in its doctors. However, medical education costs have become so high that new sources of support must be found. In seeking additional support, medical colleges are competing with other worthwhile proposals. To compete successfully, they must be able to describe their needs and their operations in terms of cost and in terms that will be understood and accepted by all concerned. Program costs will be essential.

Plans for Improved Financial Reports: The report of the recent State University of New York cost study [23] demonstrates rather conclusively that medical college fiscal operations can be analyzed in a manner that will produce appropriately comparable medical college costs. It provides detailed procedures and directions to help other medical colleges to study and analyze their own operations and compare them with the nineteen colleges covered by the report; it also describes a practicable, inexpensive system of program cost accounting and reporting. Another recent report [24] deals principally with a program analysis of medical education costs at Emory University. This report will help any medical college to understand and use program accounting more effectively. There is no serious conflict between either the principles or the methods of program cost analysis described in these two reports.

The Association of American Medical Colleges recognizes [25] "the inability to develop and report information that will permit the fiscal understanding of the manifold activities of our nation's teaching medical centers" . . . as "one of the major problems facing medical education." The Association has assumed a role of leadership to resolve this problem and it appears that it will have the enthusiastic support of all concerned.

During 1958 the Association has published the Emory University [24] and State University of New York [23] reports, and it has also obtained a grant from the W. K. Kellogg Foundation to finance a one-year "Study of Medical College Financing."

In brief, the major objectives of this study are (*a*) to develop methods to be used by all medical colleges for routine, periodic financial analyses and reports and to make a pilot study of six or eight colleges to test and prove the principles, definitions,

checklists, analyses, methods, and procedures which eventually will be used for a nationwide financial study. (This will involve studying and standardizing basic fiscal policies, practices, and terms), (*b*) to develop a practicable and inexpensive system of program accounting and to help the colleges to place the plan in operation, and (*c*) to study and clarify related fiscal and management problems.

After the analysis, interpretation, and reporting of the pilot study findings, another objective will be to prepare a proposal including forms, procedures, staff, and budget that will permit the application of this study to all medical schools that are willing to be so studied.

The committee for the pilot study believes that a questionnaire type study will not suffice. Personal visits will be made by the study director to make sure that each item of information is correctly understood and reported and to check on the interpretation of questionnaire inquiries. The personal contacts also will be in line with the committee's recognition of an essential need for a continuing educational program to help medical college administrators to adopt and use uniform management methods and reports. The A.A.M.C. doubtless will assume leadership in such an educational endeavor. In this pilot study major emphasis will be placed on the long range, continuing benefits to come from the development of uniform accounting, budgeting, and financial terminology for the use of all colleges, and the development of procedures and plans for routine, periodic financial reporting by all medical colleges.

It is apparent that medical colleges have been the victims of over simplification, and as usual the oversimplified reports have been misleading. In the new study the axiom that an accounting system or report cannot be more simple than the complexities to be dealt with will not be overlooked.

A satisfactory financial report for a medical college cannot be simple. However, completely new accounting systems rarely will be needed. It will be necessary merely to establish standard terms and consider facts as well as figures so that differences can be recognized and adjusted for reporting purposes. The individuality of a college will not be lost or even threatened.

This study is well under way, and there is every evidence that within the foreseeable future those who are responsible for medical education and its financing will be consistently guided and fortified by complete, reliable financial and operating facts and figures. For the first time they will be able to prove the financial needs of medical education and establish new standards of management efficiency. The important role of medical education in the United States will be more fully appreciated, and more adequate financial support will be provided.

AMERICAN MEDICAL EDUCATION FOUNDATION

To acquaint readers with the activities of the American Medical Education Foundation the following report has been submitted by its executive director.

Almost eight years old, the American Medical Education Foundation continues to show concrete progress in its efforts to mobilize support for the schools from the medical community. Its total income since 1951 has now passed the 7 million dollar mark. During 1957 it received 44,155 contributions, an increase of almost 5,000 givers over the previous year, and it distributed $984,787 in grants to the medical schools from its 1957 collections during February, 1958.

This significant sum of money was raised through physician committees in state and county medical societies across the country. These committees have been developing steadily in each state and now have a degree of permanence and acceptance that outweighs the income each has secured because the active interest in, and sympathy for, the medical schools and their problems adopted by these committees are creating an opportunity for better communications between the profession and the schools.

TABLE 2.—*Physician Giving to Medical Schools in the United States Showing Restrictions on Use Money Made by Donor*

Restriction	Amount of Contributions
Unrestricted	$1,467,667.31
For teaching budget	48,852.55
For specific department	85,806.37
For building fund	805,946.94
For research	294,945.18
For scholarship and student aid	71,750.74
For library	8,840.08
For endowment	193,272.52
Others	115,018.54
Total	$3,090,600.43
American Medical Education Foundation	984,787.00
Totals	$4,075,387.43

During the past year the Foundation has continued to explore ways in which its efforts and those of the alumni arms of the schools could be coordinated. A meeting between the Foundation's board of directors and representative alumni directors was held in February at which time the possibilities and problems of such coordinations were discussed.

As a companion to these explorations, the Foundation continues to collect data from the schools on physicians giving directly to the schools. Until two years ago those reports were limited to unrestricted contributions. In 1956 and 1957 all physician giving was tabulated by the restriction placed on the gifts by the donor. In this way a truer picture of the financial support received by the schools from the medical profession was developed. Table 2 shows these totals by restriction.

This steadily increasing annual giving from the graduates of the medical schools reflects their growing awareness of the financial problems of medical education.

NATIONAL FUND FOR MEDICAL EDUCATION

The accompanying resume has been submitted by the staff of the National Fund for Medical Education to acquaint readers with the current activities of the Fund in support of medical education.

The National Fund for Medical Education in January awarded grants totaling $3,078,825 to the nation's 82 accredited medical schools. This was the largest annual award in the Fund's history and brought to $15,743,766 the total distributed by the Fund since its first grants were made in 1951.

Each four-year school received $15,000 plus $65 per undergraduate medical student. The four two-year medical schools of the basic medical sciences received $7,500 each, plus $65 per student.

In addition, in May, the Fund made grants totaling $99,608 to 14 medical schools, under its special Class C Grants Program, to help American educators find ways to cope with teaching problems growing out of the rapid advancement of the medical sciences. These grants ranged in size from $2,471 to $14,500 and were given on a one-year basis.

The Fund's grants were made possible through the generosity of some 1,925 corporations, which contributed $2,050,757, as well as through a Ford Foundation Grant of $1,305,374, under its "matching" arrangement with the Fund.

In July, the Fund announced the establishment of a Medical Research Program, through which contributions from united funds, community chests, voluntary health agencies, and other organizations would be channeled into basic medical research. The program will aim to help support the continuing search for new medical knowledge, and to increase the number of trained medical researchers in the United States.

The United Community Funds and Councils of America, whose local affiliates have expressed a desire to help support broad fundamental programs of basic medical research on a national level, have already agreed to support this new research program. Negotiations have been started with various voluntary health agencies for their support of the program. This expansion of the Fund's program will in no way affect its present campaign among corporations to obtain support for the teaching budgets of the medical schools.

In October, 1958, the Fund joined with the American Medical Association and the Association of American Medical Colleges in presenting the sixth Frank H. Lahey Memorial Award to Frank Abrams, former chairman of the board, Standard Oil Company of New Jersey, and a leading philanthropist. The award is given annually to a layman for "distinguished service to medical education."

Previous recipients of the award were: President Dwight D. Eisenhower, former President Herbert Hoover, Dr. Abraham Flexner, Colby M. Chester, and Alfred P. Sloan Jr.

To celebrate the opening of Medical Education Week in April, the Fund joined with the American Medical Association and the Association of American Medical Colleges in awarding a scroll to Robert E. Wilson, retiring board chairman, Standard Oil Company of Indiana, and a founding trustee of the Fund. Dr. Stanhope Bayne-Jones was among those who paid tribute to Dr. Wilson and who helped to focus attention on the continuing need for industry to help support medical education nationally.

The Fund reports that it is continuing its campaign to alert American corporations to the problems of medical education. There are still many things that corporation executives do not understand, but the Fund feels that, with time, this will be overcome and American industry will fully realize its obligations to the medical sciences.

In April, the Fund published its 24-page annual report, "Medical Manpower for Tomorrow," showing the close link between medical education and national security. In this report, the Fund discussed the need for creative research, new goals for medicine, why medical education is expensive, and industry's stake in strong medical education.

It is the Fund's hope that during 1959 it will continue to forge ahead in its goal of bringing financial support to the medical schools.

STUDIES ON THE INTERNSHIP AND RESIDENCY ASPECTS OF MEDICAL EDUCATION

During recent years there has been an increasing interest on the part of medical education, specialty boards, organized medicine, hospital administrators, and licensing bodies in the field of graduate medical education. With a few outstanding exceptions, relatively little interest was manifested during the first decade of the current century in this field of education by others than the leading clinical teachers and the young physicians seeking additional experience.

In regard to an obvious need existing at the time, the Council on Medical Education of the American Medical Association began listing hospitals in which internship opportunities existed about 45 years ago. The Council took leadership in setting up certain basic standards or "Essentials" as minimal requirements for internship training in hospitals seeking approval for them. These basic standards have been under constant review and revision in an effort to align them appropriately with current knowledge and trends in any given period. Through the years the American Medical

Association has maintained a field and headquarters staff to evaluate these programs in terms of these "Essentials" and to assist those concerned with this phase of medical education in maintaining suitable opportunities for young physicians during their period of internship training.

As the trend toward specialization advanced, the American Medical Association, through its Council on Medical Education and Hospitals, in cooperation with representatives of the specialty fields, undertook the task of developing basic standards or "Essentials" for graduate education and training beyond the internship. These have been prepared primarily as guides to assist those developing such programs and also to furnish information to individuals seeking training. They outline the basic principles common to all residency education and training and also indicate certain requirements in the different areas of specialization. Programs of residency training have also been subject to study by the field staff of the Council prior to evaluation and accreditation. During recent years, Residency Review and Conference Committees representing both the Council and Specialty Boards have cooperatively reviewed and revised the "Essentials" in keeping with the changing scene. Furthermore, this cooperative function has extended to responsibility for approval of residency training programs, subsequently listed by the Council in the annual Internship and Residency number of THE JOURNAL. One of the important objectives of this liaison has been to foster, in residency education and training, opportunities for total training programs in single institutions or through appropriate affiliations so that individuals seeking specialty training may be assured of reasonable continuity and upgrading rather than fragmented, isolated, and inadequate segments of experience.

In 1940, the Commission on Graduate Medical Education,[28] under the chairmanship of Dr. Willard C. Rappleye, with Dr. Robin C. Buerki as Director of Study, presented a report after three years of study. This report clearly pointed out the objectives and basic principles of the internship, the residency, and postgraduate medical education on the basis of the knowledge and needs of that period. The need for constant study and reappraisal, intelligent experimentation, and flexibility of thought and actions is reemphasized throughout this report, most of which with minor modifications is pertinent to the current setting.

There have been numerous studies of the internship since the report of this Commission. Several of these have been precipitated by action of the House of Delegates of the American Medical Association. For some years the Association of American Medical Colleges has conducted studies through a Committee on Internships and currently has a Committee on Internships, Residencies and Graduate Medical Education. Some of these numerous studies have been thoroughly objective, such as the comprehensive analysis and report of the Advisory Committee on Internships to the Council on Medical Education and Hospitals which was presented in 1953. This analysis, as well as most of the special studies prior to and following the report of the Commission in 1940, have been brought about through problems arising from the service versus the educational aspects of the internship and from concern over intern distribution.

Through the activities of the Council on Medical Education and Hospitals, the American College of Surgeons, the American College of Physicians, the Specialty Boards, the Association of American Medical Colleges, and other interested organizations, it has been possible to maintain some semblance of order in graduate medical education out of what might otherwise have resulted in chaos equivalent to or worse than that existing in medical schools at the turn of the century. There are, today, no clean cut lines of division between the clinical clerkship of the final year in medical school, the internship, the residency, and even some aspects of postgraduate medical education. In many situations the same facilities and patients are being utilized, and the same faculty personnel may be engaged in all of these areas of medical education. Furthermore, advances in knowledge have been of such magnitude that the years of education in medical school no longer qualify the physician to enter practice but, instead, furnish the initial plateau upon which he erects the additional education and training needed prior to qualification for general practice or a specialty.

It is natural, therefore, that there has been aroused interest and concern on all sides regarding the graduate aspect of medical education today. This was evidenced by certain medical schools some years ago when they instituted the requirement of a year of internship prior to granting the degree of doctor of medicine. It was essential that such internships be approved by the medical schools granting the degrees so that their products could be assured of experiences as interns which were known to be desirable. This situation no longer exists and currently all approved schools grant their diplomas on completion of the final year of medical school. Concern over the merits of some of the available internships some years ago was evidenced when the Association of American Medical Colleges requested deans to prepare lists of hospitals in their respective areas where there was ample evidence that internship opportunities were well organized and adequately supervised. The exchange of such information undoubtedly assisted in the general upgrading of internship opportunities, but it was found to be not entirely satisfactory and was discontinued.

On June 10, 1958, the W. K. Kellogg Foundation announced a grant to the Association of American Medical Colleges adequate to underwrite a study of the internship as it is presently operated in medical school controlled hospitals. This study should assist in the analysis and clarification of some of the current problems associated with this initial phase of medical education beyond medical school. Has the internship become outmoded in the medical school teaching hospital where student clinical clerks, residents, fellows, and postgraduate students are also participating? Can the internship in such a setting represent the education and training experience which has been its traditional objective? Will the proposed minimum two-year program as preparation for general practice fit into the medical school controlled hospital programs and will it be considered as an extended internship or an internship-residency? What is the relationship of internships to future specialty training? Do straight internships actually provide adequate perspective or do they primarily serve the restricted service and/or educational functions of departments in which they are offered? Is the rotating internship still as desirable as it has been considered to be, and, if so, what constitutes a genuinely sound rotating experience? Has the point been reached where it may be desirable to discard traditional terminology and develop new descriptive words to encompass a better concept of basic education and training beyond medical school? Undoubtedly, this comprehensive study of medical school controlled hospital internships will cast interesting and helpful light on some of these questions.

Another interesting and challenging study is being conducted by the Division of Research in Professions of the Bureau of Applied Research of Columbia University. This comparative study of the internship and residency from the sociological point of view has been made possible by a grant from the Commonwealth Fund. Those who have developed this project believe there are many reasons why it is important to study the internship and residency as part of the total process of medical training. In other words the study will, it is hoped, indicate which types of internships reinforce and extend the training experiences of medical school and which counteract it. What kinds of hospitals place interns and residents in positions to be able to do what they are supposed to do in such matters as rounding out their range of clinical experience under competent supervision; learning through doing what they have not done sufficiently before; developing through practice what has been partially learned through precept; their role in the team responsible for comprehensive medical care; and becoming increasingly prepared to advance constantly their own competence and ultimately advance medical knowledge? What values of the young physician prove most vulnerable to "unfavorable environment" during the course of internship and residency experience; which prove most resistant to deterioration; what environments are conducive to retention and extensions of earlier learning and what are those which lead to contrary results? This study will also direct attention to a "contextual analysis" and will deal with relative merits of internships and residencies in large and small hospitals, degree of emphasis on team-work during training, and many other facets of sociological interest and importance in this type of evaluation of graduate medical education.

In this dynamic and rapidly changing scene these studies of the internship and residency are timely and challenging. There is much that must be done to determine how education beyond medical school can be made of greatest possible value in preparing the physician of today and tomorrow for the responsibilities he must assume in medical care. Along with this basic challenge is that of developing and fostering those individuals who are to be the leaders of tomorrow in teaching and research as well as in the provision of medical care. Every phase of graduate education must be reanalyzed and readjusted as time goes on so as to avoid over rigidity and too narrow restriction of knowledge and to maintain reasonable flexibility and perspective. Medical education has as its primary objective the responsibility of providing the environmental situation conducive to the development of competent physicians skilled in providing the best of medical care. With all due regard to the many other facets associated with the various aspects of medical education, this basic educational objective should always be kept in mind and graduate medical education offered which will best insure its attainment.

NATIONAL ACADEMY OF SCIENCES–NATIONAL RESEARCH COUNCIL STUDY: POSTDOCTORAL EDUCATION IN THE MEDICAL SCIENCES AND RESEARCH: A PRELIMINARY REPORT

Postdoctoral fellowship programs form an important part of medical education. The Division of Medical Sciences of the National Academy of Sciences–National Research Council have undertaken a study of such fellowship programs and their impact on medical education. Dr. Arthur S. Cain Jr., the director of this study, graciously provided this preliminary report of the study for inclusion in the Report on Medical Education in the United States and Canada.

The medical curriculum . . . has reached the limits of its capacity: it can contain no more. . . . It is clear that educationally we have come almost to an *impasse*, that the load not only cannot be increased, but that for the sake of good teaching it must be lightened and simplified. The medical student . . . must have a timely opportunity to ground himself in fundamental studies, and to learn how to think, how to observe, how to apply. Every pedagogical consideration, there-

fore, points to the conclusion that the elementary underlying sciences must be learned by the student of medicine . . . before he enrolls himself in the professional school.

So wrote Henry S. Pritchett in 1912, two years after Abraham Flexner [27] had surveyed the shocking state of American medical schools. There were those who disagreed with Pritchett's estimate of the importance of basic scientific studies to the student of medicine. Some said elementary basic scientific knowledge was superfluous; it was enough to learn professional medical techniques well without understanding their scientific basis or questioning their scientific validity. Others seemed to be saying, "We must understand well the scientific basis of what we do to improve and expand our knowledge, and thus improve our clinical abilities."

Pritchett continued:

> Very interesting statements have recently appeared in American educational journals, calling attention to the fact that students who lack this (scientific) preparation appear to have made quite as good showing in certain medical schools as those who have it. Without going too far into an analysis of the facts that are advanced in support of this contention, it needs to be said that even were this true, it is beside the mark. It still remains certain that the youth who has not pursued these fundamental sciences does in the medical school an entirely different thing from the one who has been properly trained in them. Teachers of medicine readily admit that for students who have really mastered their elementary physics and chemistry and biology, medical education becomes a wholly different thing from what it is for those who have not gained that foundation, not only because the man so trained can begin at a different point, but also because he is familiar with scientific concepts, scientific nomenclature, and scientific methods of reasoning.

All were agreed that the medical curriculum in 1912 could hold no more, nor could the human brain assimilate rapidly accumulating knowledge. Nevertheless, curricula were expanded, premedical scientific studies were prescribed, and the basic sciences became an increasingly important part of medical education.

Today, the struggle for adequate insight and proficiency in the basic sciences of medicine seems at its zenith. The variety of scientific disciplines contributing to medical knowledge now extends into areas of physical and biological science not long ago little used by medical scientists. Clinical investigation has shifted from what was once called (by some) "applied" research to research of a very fundamental kind. Doctors of medicine and doctors of philosophy, especially those headed for careers in academic medicine and research but also increasing numbers of physicians who will make their careers in medical practice, seek ways to gain advanced basic scientific proficiency as an essential tool for productive careers. Through modern "fellowships," many of them find the way.

Fellowships in the medical sciences were born of the readjustments and turmoil of the first Flexner report (1910) and the need of medical school faculties for stronger basic scientific foundations. In 1921, when most of the proprietary medical schools had closed and medicine was finally within the universities, the Division of Medical Sciences of the National Academy of Sciences–National Research Council proposed that fellowships in the medical sciences be offered in national competition. The first such fellowships were soon established by the division and supported financially by the Rockefeller Foundation. That support has been continuous since the inception of the fellowships.

Those first fellowships gave young medical scientists an opportunity to improve their basic scientific backgrounds and sought to influence them toward careers in teaching and research. The popularity and success of the fellowships can be seen in the many such fellowships offered today.

In 1956, Dr. R. Keith Cannan, chairman of the Division of Medical Sciences, National Academy of Sciences–National Research Council, called attention to the variety and number of available fellowship opportunities and the rapid changes taking place in medical education and research. He proposed a study of postdoctoral fellowship rograms to determine their appropriateness to the developing needs.[28] As a result, the present survey of fellowships and similar training schemes, together with their impact on medical education and the medical schools, was undertaken. The financial support of the John and Mary R. Markle Foundation made the survey possible. The active cooperation of the Council on Medical Education and Hospitals of the American Medical Association and of the Association of American Medical Colleges has provided valuable assistance, and the National Institutes of Health, through a recent grant, aided in the rapid analysis of data by punch card methods.

Mrs. Lois G. Bowen, Professional Assistant of the Academy-Research Council and for some years responsible for the administration of the medical fellowship programs of the Academy-Research Council, has worked closely with the Director of the Survey from the beginning. The checking and preparation of thousands of questionnaires for analysis has been a complex problem for Mrs. Bowen and her assistants.

For the purpose of this survey, a fellowship is defined as financial support awarded to a doctor of medicine, doctor of philosophy, or scientist of equivalent education for full-time advanced study and training in basic medical sciences and research. The awards, with very few exceptions, are for a period of at least one year. The "junior postdoctoral research fellowship" is awarded to young scientists not yet established in a career and in need of more thorough training and experience in basic science and research methods. "Senior" and "advanced" fellowships are awarded to established medical scientists chiefly for concentrated research and study, usually for a period of three to five years. Occasionally, in the case of some senior scientists,

they are awarded for shorter periods. Most junior fellowships exclude more than minimal teaching and clinical responsibilities. The fellowships studied in this survey were awarded in national competition. There are also other fellowships awarded by local agencies and institutions. These latter are not included in this report but will be discussed to a certain extent in the final report.

TABLE 3.—*Distribution of Applications and Awards of Fellowships by Doctoral Degrees*

	Successful Applicants			Unsuccessful Applicants*			
Type of Fellowship Sought	M.D.	Ph.D.	M.D. and Ph.D. held	M.D.	Ph.D.	M.D. and Ph.D. held	Totals
Junior postdoctoral	402	352	11	166	174	6	1,111
Senior or advanced	71	70	8	32	23	9	213
Either type (double application, would accept either award)	14	17	0	4	5	1	41
Totals	487	439	19	202	202	16	1,365
Double applicants (would accept either award)							
Received junior award	12	10	0	...	...	...	22
Received senior award	2	7	0	...	...	...	9

* Includes a few candidates who withdrew their applications prior to consideration.

Scope of the Survey

The survey was divided into six areas.

1. Opportunities for advanced training and experience in medical sciences and research available through the postdoctoral fellowships offered by more than twenty-two national agencies were studied. The purpose and regulations of these fellowship programs were analyzed to determine, insofar as possible, the kind and number available at junior, senior, and intermediate levels. Emphasis by the various agencies on specific scientific disciplines or disease categories and restrictions on the assumption of general academic responsibilities during the fellowship were also reviewed.

2. All applications submitted by doctors of medicine and doctors of philosophy for these fellowships during one test year (1955-1956) were analyzed. The curriculum vitae of each applicant, his area of research interest, and future career plans were included in material abstracted for study.

3. The chairmen of each of 11 departments of the United States medical schools were consulted by questionnaire for estimates of the balance between teaching and research in their respective departments and the supply and quality of applicants for budgeted vacancies on department staffs. The chairmen were also asked to complete tables giving educational background (by academic degree), postdoctoral fellowship histories, and information on financial support of department staff members. Similar information was also requested about postdoctoral fellows currently in the departments.

4. All current and past fellows of the 22 national agencies studied in parts 1 and 2 were consulted by questionnaire concerning their fellowship experience, present positions, plans for the future, attitudes toward academic and research careers, and clinical experience. Comments and suggestions were invited. Three questionnaires were used—one to all alumni of the 22 fellowship programs since 1945, plus all who held fellowships in 1939-1940; a second questionnaire to all 1957-1958 junior postdoctoral fellows; and a third to all 1957-1958 senior and long-term fellows. The three questionnaires were similar but altered to make them appropriate for their respective recipients.

5. All 1957-1958 interns and residents in primary teaching hospitals of every United States medical school were sent questionnaires. The questionnaires sought career interests, attitudes toward academic careers, research, private practice, and the nature and amount of additional study and training they deemed necessary. An evaluation of available training and fellowship opportunities and their estimates of the obstacles to acquiring additional training was also sought.

6. Finally, full-time members of all departments of anatomy, microbiology, biochemistry, pharmacology, physiology, medicine, and surgery were sent questionnaires. They were asked about academic responsibilities, especially teaching, research, and administrative loads. Educational backgrounds (by academic degrees, clinical training, and fellowship experience), sources of financial support, and other information was also requested. Additional departments will be included in this part of the survey.

Results

The results presented are selected for their appropriateness to this education number of THE JOURNAL.

One thousand three hundred and sixty-five doctors of medicine and doctors of philosophy submitted applications for junior or advanced fellowships in the medical sciences to one or more of the national agencies surveyed. Their applications were

TABLE 4.—*Distribution of Incumbent 1957-1958 Fellows by Doctoral Degrees*

	Fellows, No.	M.D.'s	Ph.D.'s	Sc.D.'s	Two or More Doctorates Held
1957-1958 Junior fellows	463	302	207	3	9
1957-1958 Senior fellows	289	195	117	3	26
Past fellows 1946-1956 incl., and 1939-1940	2709	1760	1122	34	207

filed in 1955 and 1956 for fellowships the first year of which would terminate on or before Dec. 31, 1957. There were 48 more M.D.'s than Ph.D.'s among the applicants, and 35 applicants held both degrees. More than two-thirds of the applicants were awarded fellowships. The ratio between M.D.'s and Ph.D.'s in the successful group was approximately the same as in the whole group of applicants. A few applicants applied for both junior and senior awards, leaving the decision as to which

was appropriate to the selection boards. Table 3 shows the distribution of applicants by degrees held, awards sought, and awards received.

Three thousand nine hundred and eighty-nine present and past fellows of the national agencies surveyed were sent questionnaires. These included all fellows since 1945, plus those who had awards in 1939-1940, and all 1957-1958 fellows. The 1957-1958 fellows are referred to as "present" fellows. Three thousand four hundred and seventy-four, or 87.1%, completed and returned their questionnaires. Of these, 3,461 questionnaires were coded and studied by punch card methods. Two thousand seven hundred and nine past fellows, 463 present junior fellows, and 289 present senior fellows were included. The distribution of M.D.'s, Ph.D.'s, and Sc.D.'s is shown in table 4.

All fellows, present and past, were asked to give their choice of careers without consideration of the economic rewards and then to give their choice

TABLE 5.—*Career Interests of Fellows*

Career Choice	Past Fellows: If economic rewards were equal	Past Fellows: Under present economic conditions	1957-1958 Present Junior Fellows: If economic rewards were equal	1957-1958 Present Junior Fellows: Under present economic conditions	1957-1958 Present Senior Fellows: If economic rewards were equal	1957-1958 Present Senior Fellows: Under present economic conditions
1. Full-time academic post with good balance between teaching, research, and administrative duties	1,710	1,139	324	253	234	178
2. Full-time research with no other responsibilities	375	414	87	66	39	27
3. Clinical investigation and medical practice in a full-time academic position	545	530	75	96	37	54
4. Full-time private medical practice	71	344	9	33	Not requested	

Note: There are a few double choices included in the above figures. They usually represented indecision between numbers 1 and 2.

under the realities of present day economics. The majority in all groups preferred a full-time salaried academic career if economic conditions could be disregarded, but approximately a third of these shied away from full-time salaried academic post's under the economic realities of academic life. Table 5 indicates the career choices of present and past fellows under conditions as they exist today and under conditions in which economic rewards would not be a deciding factor.

One thousand five hundred and fifteen past fellows were found to be in full or part-time academic positions. There were 226 professors, 125 associate professors, 571 assistant professors, and 194 instructors in this group. Five hundred and forty-nine were research associates and assistants or held other university titles. One thousand two hundred and nine past fellows were not in full-time academic posts, but 419 of these had held such positions in the past, while 790 had never held full-time academic jobs. All past fellows who did not hold full-time university positions at the time the questionnaires were completed were asked if they would accept such a position if assured of a suitable balance between teaching, research and administrative responsibilities in their work. Only 192 indicated that they would not. The faculty ranks for which those who said they would consider full-time academic careers thought themselves qualified are shown in table 6 and the minimum salary ranges they would accept are shown in table 7. The rank and salary expectations of present fellows are also shown in tables 6 and 7.

TABLE 6.—*Estimate of Their Faculty Rank Qualifications by Fellows Who Would Accept Full-time Academic Positions Under Suitable Work Arrangements*

	Past Fellows	1957-1958 Junior Fellows	1957-1958 Senior Fellows
Professor	217	7	73
Associate professor	456	35	147
Assistant professor	537	265	72
Instructor	148	175	7

Note: In some cases there was indecision between two ranks, usually at junior levels, and there is a small number of double choices included.

One thousand and eighty-five past fellows had no teaching experience in their fellowships, and an additional 1,216 had very little. Only 392 indicated significant teaching activities as fellows. Six hundred and fifty-nine who had had little or no teaching experience considered this a disadvantage and thought that fellowships should include teaching experience, but 981 disagreed with them. Present junior and advanced fellows who were engaged in at least some teaching in their fellowships considered the experience beneficial by more than ten to one.

The value of clinical training to the fellow concentrating on basic science and research experience has long been disputed by various segments of the medical fraternity. It is interesting to note that only 49 physicians among the past fellows have not served an internship, and most of them have spent at least one year in a residency. Almost half of the physicians among the past fellows are diplomates of medical specialty boards, and a majority of those who are not diplomates intend to seek certification.

TABLE 7.—*Minimum Salary Ranges Acceptable to Fellows Who Would Accept Full-time Academic Posts*

Range	Past Fellows	1957-1958 Junior Fellows	1957-1958 Senior Fellows
$6,000 or less	120	179	12
$6,000 to $8,000	297	174	51
$8,000 to $10,000	312	64	88
$10,000 to $12,000	148	13	48
$12,000 to $15,000	102	7	45
Over $15,000	127	0	14

Among present fellows, 22 physicians had not served internships and 72 had had no residency training. In table 8 the clinical training and specialty board status of present and past fellows is shown.

TABLE 8.—*Clinical Backgrounds and Specialty Board Status of Present and Past Fellows Who Hold the M.D. Degree*

	Past Fellows		1957-1958 Junior Fellows		1957-1958 Senior Fellows	
	Yes	No	Yes	No	Yes	No
Served internship	1,706	49	251	11	184	11
Served residency	1,541	203	217	45	166	27
Certified by a medical specialty board	845	903	23	239	88	105
Intends to seek certification	587	266	195	35	59	45

Two-thirds of the past fellows who had had internships or residencies thought that their clinical training had helped them profit from their fellowships. The clinical training, they indicated, had been beneficial to them in planning, conducting, and interpreting their research. Their comments often suggested that clinical training had made possible a clear idea of their research interests and the depth and breadth of basic scientific studies necessary for adequate pursuit of these interests.

Nine thousand four hundred and thirty interns and residents in the primary teaching hospitals of all United States medical schools received questionnaires, and 7,422, or 78.7%, responded. Of those responding, approximately 884 were graduates of foreign schools, and they will be considered separately in the final report of the survey.

Alternate questionnaires from graduates of United States medical schools (half of those returned, or 3,269) were coded and analyzed by

TABLE 9.—*Specialty Board Aspirations of Interns and Residents*

Specialty Certification to be Sought	Number
Medicine	682
Surgery	458
Obstetrics and gynecology	309
Pediatrics	285
Psychiatry and neurology	208
Radiology	164
Orthopedic surgery	156
Pathology	149
Ophthalmology	113
Anesthesiology	98
Urology	82
Thoracic surgery	65
Neurological surgery	61
Dermatology and syphilology	50
Otolaryngology	50
Plastic surgery	28
Physical medicine and rehabilitation	11
Proctology	2
Preventive medicine	1

punch card methods. The incoming questionnaires were filed so that half of the returns from each hospital were included in the total. Eight hundred and eighty-nine interns, 2,305 residents, and 75 clinical trainees were represented in this sample. The data here presented are taken from this 50% sample and reported in terms of numbers and percentages of 3,269. The questionnaires not analyzed by machine methods are being studied for comments and suggestions and included in the final report.

Twenty-seven of the interns and residents held Ph.D. degrees, twelve the Sc.D., and 146 the Master's degree.

The interest of these interns and residents in advanced training in special clinical areas, advanced basic scientific study, and research training beyond any they had had, and teaching, was abundantly expressed in their responses. Only a handful, 105 out of 3,269, said they did not want to seek specialty board certification. Medicine and surgery, respectively, were the first two specialty choices. Obstetrics and gynecology, pediatrics, and psychiatry and neurology followed in that order (table 9). Only a few, 85, were undecided about specialty board certification.

Approximately two-thirds of the interns and residents wanted additional training in research regardless of their future career plans. Some preferred to gain this experience concurrently or intermittently with residency training, if possible. Others wanted fellowships and traineeships, and

TABLE 10.—*Preferred Mode of Research Training*

	Number
Concurrent with residency	844
Intermittently with residency	856
Full-time research fellowship	324
Clinical traineeship	444

some were undecided as to the best method (table 10). Six hundred and thirty-six interns and residents planning careers essentially in private practice planned to engage in research along with their practices.

Only 245 in the intern-resident group, or 7.2%, indicated that they did not want to participate in teaching or research once they entered upon their careers, while 1,898 who plan careers essentially in private medical practice want to make teaching a part of their careers. In addition, 810, or 24.7%, want careers in full-time or essentially full-time academic positions. Almost a third of these (252) prefer full-time salaried positions and the rest "geographical" full-time. Only 33 interns and residents preferred full-time positions in a basic science department or a research institute.

Asked to evaluate some aspects of research fellowships and clinical traineeships, the interns and residents looked with disfavor by approximately four to one on regulations which exclude opportunities to maintain clinical proficiency during fellowship or traineeship. The exclusion of teaching opportunities was regarded with approximately the same disapproval.

Dissatisfaction with the breadth and depth of their basic scientific backgrounds was stated repeatedly in comments by the interns and residents,

regardless of whether they were headed for academic careers or private practice. In answer to specific questions and in appended discussions of the subject, they expressed a desire and often a determination to understand and use the concepts and research methods of the basic sciences, physical as well as biological, in their future work. Statistical data on this subject and an analysis of the comments will be a part of the final report of the survey.

The final report from the survey from which this preliminary report is drawn will be made to the Medical Fellowship Board of the Division of Medical Sciences, National Academy of Sciences–National Research Council. The Board, under the chairmanship of Dr. Sam L. Clark, Vanderbilt University, has participated actively in the conduct of the survey, and the final report will provide a basis for the Board's recommendations to the Division on future postdoctoral fellowship activities.

REPORT OF THE SECRETARY'S CONSULTANTS ON THE ADVANCEMENT OF MEDICAL RESEARCH AND EDUCATION THROUGH THE DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

On July 14, 1958, Secretary Marion B. Folsom released as a public document, the final report of the Secretary's Consultants on Medical Research and Education, entitled "The Advancement of Medical Research and Education Through The Department of Health, Education, and Welfare." Dr. Stanhope Bayne-Jones, formerly dean of Yale University School of Medicine, president of the Joint Administrative Board of the New York Hospital-Cornell Medical Center, and technical director of research, Office of the Surgeon General, Department of the Army, chaired the group of 10 prominent medical educators and industry research executives who participated in the study.*

When the consultants were appointed, Secretary Folsom indicated that among the reasons for this action were (*a*) the recent very rapid and large expansion of the medical research programs of the Department of Health, Education, and Welfare and (*b*) his concern that the medical research effort, which had contributed substantially to the health of the American people, should continue to make a maximum contribution based on wise policies, sound administration, and a competent scientific staff. The consultants were expected to look into such matters as (*a*) the activities of the Department of Health, Education, and Welfare in the fields of medical research and education, (*b*) the situation (state and needs) of medical research and education in the country as a whole, (*c*) the impact of the expanding research programs on medical education, (*d*) the availability of scientists, technicians, and facilities, (*e*) the relative emphasis given to research in the various disease fields, (*f*) the relative emphasis given to fundamental studies in the basic sciences generally, (*g*) the standards for approval of research projects, and (*h*) the relationship between federal and private research programs.

This study originally was designed to cover a two-year period, but at the request of the Secretary was shortened so that it might be submitted prior to his withdrawal from the Department of Health, Education, and Welfare in the summer of 1958. The report indicates that all of the consultants felt privileged to undertake this important assignment and that they were pleased to be able to give the Secretary their mature judgment on the matters with which they dealt. Secretary Folsom indicated his appreciation of the task commenting in the preparatory note that they had "performed their public service with distinction." He, furthermore, stated that the report was being made available as a public document in the belief that it will be of interest "not only to all those concerned with medical education and research, but those interested in the determination of policies and plans for research."

The report indicated the consultants believed that "expenditures for medical research in this country can and should be tripled to reach a billion dollars annually by 1970." To develop a medical research effort of this magnitude will necessitate an augmentation in the number of physicians and other scientists engaged in medical research from the current 20,000 to 45,000 by that date. The consultants indicated that funds for construction of medical schools will be needed "on a much larger scale than has heretofore been contemplated" and that even if large funds are provided "it seems certain that the number of physicians per 100,000 population will decline during the next 12 years." The report also states that "the expansion of medical research and education required in the national interest will be costly and should not be restricted by lack of funds." In 1957, for instance, total national medical research expenditures approximated

* In addition to Dr. Bayne-Jones, the special consultants were George Packer Berry, M.D., Dean, Harvard Medical School, Boston, Mass.; Thomas P. Carney, Ph.D., Vice-president, Research Development and Control, Eli Lilly and Company, Indianapolis, Ind.; Lowell T. Coggeshall, M.D., Dean, Division of Biological Sciences, University of Chicago, Chicago; Fred Carrington Cole, Ph.D., Academic Vice-president, Tulane University, New Orleans; Samuel Lenher, Ph.D., Vice-president, E. I. duPont de Nemours and Company, Wilmington, Del.; Irvine H. Page, M.D., Director of Research, Cleveland Clinic Foundation, Cleveland; Robert C. Swain, Ph.D., Vice-president in Charge of Research and Development, American Cyanamid Company, New York; Stafford L. Warren, M.D., Dean, School of Medicine, University of California Medical Center, Los Angeles; James Edwin Webb, President, Republic Supply Company, and President, Frontiers of Science Foundation of Oklahoma, Oklahoma City, former Director of the Bureau of Budget, and former Under-Secretary of State.

330 million dollars in comparison to the 900 million to 1 billion dollars which the consultants consider a conservative projection for 1970.

The consultants expressed the belief that the public interest would not be served if the ratio of physicians per 100,000 population falls below 132, which has been a relative constant during the past 30 years. To maintain this approximate ratio it is pointed out that from 14 to 20 average size medical schools should be developed to meet the needs of 1970 and that these will cost between 300 million and 1 billion dollars. Since there is a lag of approximately 10 years between the planning of a new school and the graduation of its first class, the consultants indicate that there will almost inevitably be a decline in the number of physicians per 100,000 between the present time and 1970.

The report states, "Unless there is a marked change in social philosophy leading to private gifts or state appropriations on an unprecedented scale, large federal appropriations will be required."

In discussing the support of medical research, the report suggests that the federal government should continue to provide about half of the funds needed so that by 1970 federal expenditures should increase from 186 to 500 million dollars. Last year industry contributed an estimated 90 million, private philanthropy 35 million, and endowment income approximately 19 million dollars. The committee projected for 1970 annual expenditures of over 300 million dollars from industry and over 100 million from private philanthropy.

The report covered many other areas, including an analysis of both physicians and Ph.D. potential additions in the field of medical research, the role of the Public Health Service and, particularly, the operations of the National Institutes of Health in this field.

This report should be carefully read and analyzed by thoughtful individuals, as the recommendations carry significant implications and challenges. As has been repeatedly pointed out in this and previous education numbers of THE JOURNAL, the present rapidly changing scene is beset with unknowns of many kinds. There are augmented needs in every area to meet the increased challenges of the growing population and the socioeconomic as well as scientific advances. These are not the type of challenges that can be successfully met with a "crash program" but rather necessitate sound, intelligent consideration. This study clearly implies the need for such objective analysis. Large financial resources, in themselves, carry no guarantee of solving these problems. Adequate financing makes the potentialities of any given situation better, providing they are realistic and attainable. The question can logically be posed as to whether all new medical schools in the future should be developed as elaborate research institutes or whether there is not a place for additional schools where the major focus is on sound education and more modest emphasis on research. Both educational and research aspects are vital to all institutions conducting medical education, but unless reasonable balance is maintained in planning for the future, the educational function of the medical school may be jeopardized through overemphasis on research alone.

PROGRESS REPORT SUBMITTED BY COMMITTEE ON PREPARATION FOR GENERAL PRACTICE

After a year and a half of study, the Committee on Preparation for General Practice on May 20, 1958, submitted a Progress Report to its three parent organizations, the American Medical Association, the Association of American Medical Colleges, and the American Academy of General Practice. The Board of Trustees of the American Medical Association subsequently presented the Progress Report as Supplement A in its report to the House of Delegates at their June (1958) meeting in San Francisco. In submitting this Progress Report the Committee expressed the hope that it would be carefully read and evaluated by all concerned and that any criticisms or suggestions be submitted to it for consideration prior to the preparation of a more definite final statement. The complete text of the report has been published in the Sept. 6, 1958, issue of THE JOURNAL as part of the Proceedings of the San Francisco Session and is referred to the attention of those who wish to review the complete text.

The report of this Committee merits serious study on the part of those interested in and concerned with basic or graduate medical education, specialty education and training, and licensure. After reviewing all aspects of current preparation beyond medical school, the Committee expresses the opinion that:

> The remarkable advances in medicine that have occurred and that will continue to occur have increased the difficulty and the complexity of general practice as well as of other specialty practices. The responsibility of the general practitioner is a heavy one. It demands knowledge, alertness, agility of mind, and a wisdom born of education and experience. It necessitates the possession of a sound knowledge of the fundamentals of medicine as well as a synoptic knowledge of the basic principles of special fields. In view of this, as well as the pattern that has been followed successfully in the specialty fields of developing graduate educational programs beyond medical school, the Committee recommends that a new graduate educational program for general practice be developed.

The proposed program constituting the final portions of the Progress Report is presented because of its inherent challenges to medical education and particularly to those who are endeavoring to offer graduate education and training in the field of general practice in keeping with current knowledge and needs.

The Proposed Program

In recommending a new graduate program for the general practice of medicine, the Committee believes that *primary* consideration should be given to an educational experience enabling the physician to provide medical care for all members of the family irrespective of age. After determining that the period beginning at the time of receiving the M.D. degree is the most appropriate one for a new plan of preparation for general practice, the Committee agreed to concern itself with a minimal program. It was considered best at the outset to avoid being compromised by programs presently in existence or by current limitations imposed by statutes or military obligations. This proposed program is designed to replace for future general practitioners, the current internship as well as existing residency programs in general practice.

The internship year as presently constituted cannot be considered as a component of this program for it would result in dividing it into two separate segments. The internship was designed many years ago to provide the initial contact with and responsibility for patients. Since the development of the clinical clerkship, it no longer comprises such initial patient contact but rather it is now considered as one of several graded steps toward the assumption of total responsibility for patient care. Further, there is now general agreement that the one-year internship alone is inadequate as preparation for the practice of medicine. The Committee believes the one-year internship encourages inadequate preparation for general practice.

The present values of the internship will be an inherent part of the proposed program, but cannot be separated out of it as a segment without weakening the greater values to be derived from dealing with the new program as a unified whole. The graduate program proposed as preparation for general practice is designed to be more comprehensive than the internship in regard to patient responsibility, educational content, and continuity of experience.

Under the existing circumstances, it is believed that a period of at least two years of formal hospital training following attainment of the medical degree is necessary in preparation for the general practice of medicine. However, time alone cannot serve as a valid measure of educational adequacy. *The two-year period would be minimal even where the other factors of educational quality and content are optimal.*

The graduate program of two years in preparation for general practice should be planned and implemented as a unified whole. Since the general practitioner is to provide continuing care, it is highly important that the preparation for this kind of practice be designed to assure every possible opportunity for the participant to study patients over relatively long periods of time. He should follow the patient, as necessary, in the outpatient service, when indicated in the home, and certainly from one hospital service to another. There should be a maximum continuity of assignment to specific services so that the program will stress education through continuing rather than episodic medical experience. Such a unified two-year program will permit and encourage the necessary progression of responsibility and content.

This two-year program should include a basic eighteen month period to provide experience in the diagnostic, therapeutic, psychiatric, preventive and rehabilitative aspects of internal medicine and pediatrics in a very broad sense. In addition to the basic period, the opportunity for training in obstetrics should be a requisite for all programs. Participants who plan to practice obstetrics are encouraged to spend the major portion of an elective six months in obstetrical training. For those who do not anticipate an obstetrical practice, the six month elective should be utilized for further training in other segments of the program. It is urged that the concept of unity be applied to the elective period to prevent unduly short assignments that would provide little educational justification.

Throughout the two-year program, the trainee should have experience provided by regularly assigned periods of emergency room service. The Committee believes that this should include training in the emergency and primary management of trauma and in minor surgery. (The working definition of the latter is that minor surgical procedures are those which in themselves have no expected mortality, require no medical assistants and, in suitable circumstances, may be performed satisfactorily outside the hospital.)

Because the care of the ambulatory patient is an important part of medical practice, provision of adequate opportunities for the study of outpatients is essential. This should constitute a part of the basic eighteen month period and may well continue through the other six months. It should include experience in medical or diagnostic gynecology.

Experience in the care of the new-born infant is considered an essential portion of the program.

The proposed two-year program should assure the opportunity for adequate preparation of the physician to provide medical care to all members of the family. Any physician planning to undertake obstetrics other than uncomplicated obstetrics, or surgery other than minor surgery, should have additional adequate training.

The Committee believes that such a two-year experience would furnish a sound base for further graduate medical education in any field. The Committee therefore recognizes that the thoughtful cooperation of specialty groups will be required to implement a sound program for preparation for the general practice of medicine.

This report outlines the minimal program under optimal circumstances. There will be those physicians who will elect further graduate education and such should be encouraged.

Finally, the general practitioner, like all other physicians, will be expected to pursue a continuing program of postgraduate medical education.

The Committee envisages certain further studies as required for the completion of its assignments. In view of the thoughtful cooperation of specialty groups needed for successful implementation of the proposed program, the Committee is holding formal consultations with such specialty groups as an essential preliminary to the more specific and detailed planning of the proposed minimal program. It expects to include consideration as to whether this program of preparation for general practice should be called an internship or a residency, or identified in some other manner. The Committee, in cooperation with the specialty groups involved, will give consideration to the type of recognition that may be developed for those individuals who successfully complete a part or all of this proposed program.

SECOND WORLD CONFERENCE ON MEDICAL EDUCATION

Planning has progressed satisfactorily to date for the Second World Conference on Medical Education, scheduled to be held in Chicago, Aug. 30 to Sept. 4, 1959. The general theme of this program, "Medicine—A Lifelong Study," will deal with the challenges of education beyond completion of basic medical studies. Since the first World Conference (London, 1953) was centered around consideration of the area of basic medical education, this projected conference will afford the opportunity to conduct similar exchange of viewpoints on problems and challenges associated with medical education beyond this level.

The Second World Conference will follow the general format which proved so eminently satisfactory at the London Conference in the use of initial and final plenary sessions with a series of

four half-day interim panels. The panel sessions will devote considerations to (*a*) basic clinical training for all doctors, (*b*) advanced education for general and specialty practice, (*c*) the development of teachers and investigators, and (*d*) continuing medical education.

Arrangements are being made for preconference and postconference tours so that visiting medical educators from abroad may visit medical teaching centers. The initial response relative to participation on the part of outstanding foreign medical educators has been most gratifying and it is hoped that there will be a large attendance of American educators actively participating in making this a valuable and mutually stimulating experience for all. Those planning to attend should make their hotel reservations in Chicago well in advance. Headquarters will be at the Palmer House.

INITIAL TEST OF COOPERATIVE ANALYSIS OF PROBLEMS OF MUTUAL CONCERN LEADS TO PROPOSAL FOR PERMANENT LIAISON BETWEEN HIGHER EDUCATION AND ORGANIZED MEDICINE

In the 1955-1956 Annual Report on Medical Education in the United States and Canada [29] the "Conclusions and Recommendations of the Council on Medical Service Related to Private Practice by Medical School Faculty Members" was reported in detail. One of the recommendations was to the effect "that on request of a medical society and a medical school, the American Medical Association Board of Trustees establish, in cooperation with the Association of American Medical Colleges, a special committee whose function would be to investigate areas where there is friction between the medical school and the profession. Such a committee might (1) assure the continuation of liaison, (2) see to it that all data and facts are made available to all concerned, and (3) seek to resolve difference of opinion."

During April, 1958 occasion arose to utilize this mechanism as a result of a written request to the Board of Trustees from the president of the Medical College of Georgia, the president of the Richmond County Medical Society and the Council of the Medical Association of Georgia, together with the approval of the Chancellor of the Board of Regents of the University of Georgia. The Committee was appointed to study and mediate differences of opinion among doctors in Georgia regarding the policies of the Medical College of Georgia and its teaching hospital, the Eugene Talmadge Memorial Hospital. The Committee was appointed in cooperation with the Association of American Medical Colleges and consisted of seven physicians together with a staff member from the Law Department of the American Medical Association. The Committee spent three days on location analyzing the background of the problem, meeting with members of the local and state societies, the medical college and the Board of Regents of the University System, first individually, and finally collectively. After thorough discussion, oral agreement was reached in regard to four major areas of concern. This was then reduced to writing and subsequently signed by the presidents of the local medical society, the Medical Association of Georgia, the Medical College of Georgia, and the Chancellor of the Board of Regents of the University System.

The value of cooperation of this type in the objective analysis of the difficulties and misunderstandings which arise on occasion between medical schools and the profession has been clearly illustrated in this first instance of the application of the 1956 recommendation. The need for better liaison between higher education, representing the parent universities of which medical schools form components, and organized medicine has been apparent to many thoughtful individuals for some time and was also clearly highlighted in the Georgia situation.

Subsequent considerations have led to the proposal that it would be highly advantageous to all concerned to establish a "top-level" liaison between higher education and organized medicine to consider some of the mutual areas of concern that lie ahead. It has been proposed that this "top-level" liaison committee, to which reference has been made earlier in this report, consist of a representative from the presidents of universities in which medical schools exist, one from medical schools without university affiliation, two from the Association of American Medical Colleges, two from the Board of Trustees of the American Medical Association, and two from the Council on Medical Education and Hospitals, with staff representation from the latter three groups. It is anticipated that this committee will consider problems having mutual impact on medical education and medical practice such as the rapidly growing programs of prepayment for medical care, the increasing need for full-time faculty personnel to conduct teaching and research, and the ways and means where difficulties and/or misunderstanding created by the changing situations may be avoided or resolved. Such cooperative liaison carries great potential for avoiding in the future some of the difficulties which might have been obviated through more adequate objective intercommunications in the past.

REGIONAL INTERSTATE COMPACTS AND MEDICAL EDUCATION

The following resumes of the interest and activities of the Southern Regional Education Board, the Western Interstate Commission for Higher Education, and the New England Board of Higher Education were submitted for inclusion in this education issue of THE JOURNAL *to summarize the current status of these programs in the field of medical education.*

Southern Regional Education Board (SREB) and Medical Education

Over the past 10 years, the SREB program has had considerable effect on medical education in the 16 Southern states. Its impact is reflected both in the numbers of students and the amounts of money (table 11) that have crossed state lines under regional contracts since the beginning of the nation's first regional education compact.

Represented in these figures are significant benefits to states and institutions:

1. States which until quite recently did not have public medical schools assured medical training for sizable numbers of their citizens during a time when competition for admission was great.

2. Medical schools accepting contract students have received new money not available before the contracts, money which supplemented funds obtained from usual sources. Emory University School of Medicine, for example, has received to date some $775,000 under medical contracts, making it possible for Emory to avoid retrenching its instructional program during a period when it was reorganizing its medical school finances.

3. Meharry Medical College has received sufficient funds from the contracts to make it possible for it to continue medical training for many Negro students who might not otherwise have had an opportunity to enter medicine.

4. In some instances, the contracts have broadened the geographical area from which students were selected, with increase in quality of students.

As new medical schools were built during the past few years, the number of students under the contracts in medicine has diminished. If states use regional contracts solely to reserve spaces in out-of-state schools, the contracts will have limited use, since they do not provide capital funds for expanding the capacity of medical schools. However, some states with only one medical school eventually will be unable to meet student demands or needs for graduates. Expansion of some schools for interstate use will both save money and improve quality of training. Such selective expansion will be easier if the expanding schools have assurance that they will receive funds from contracts over a period of time in exchange for admission of quotas of students from other states. States will probably not be willing to contribute to capital costs of expansion, though the same effect can be achieved by setting the payments under contracts at figures which are high enough to cover instructional costs and amortization.

At the request of the Southern Governors' Conferences in 1954, SREB established a regional program to increase training and research in mental health fields, including psychiatry as well as other professions. The program, guided by a council composed of commissioners of mental health, professors of psychiatry, and other groups, has stimulated states to put more money into training and research, and has wrestled with reducing the personnel shortages which plague mental hospitals and clinics by encouraging more students to enter the mental health fields.

It has also been suggested that SREB study the possibility of using contracts (1) to stimulate expanded programs of postgraduate work in medicine and (2) as a means by which medical schools could increase quality of students through widening the geographic origin of student bodies. Neither of these two suggestions, however, has thus far gained widespread support among either medical educators or state officials.

Western Interstate Commission for Higher Education

The Western Interstate Commission for Higher Education (WICHE) is a regional education agency, organized and financed by 11 western states (Arizona, California, Colorado, Idaho, Montana, New Mexico, Oregon, Utah, Washington, Wyoming, and Alaska). The commission was set up by an interstate compact in 1950, at the initiative of the Western governors. WICHE is a fact-finding agency and a clearing house for ideas and proposals of interstate concern. Its task is to promote interstate approaches in higher education, particularly in the health sciences.

TABLE 11.—*Southern Regional Education Board (SREB) and Medical Education*

	Students, No.	Amount of Money Paid by States
1949-1950	174	$240,000
1950-1951	245	372,000
1951-1952	335	492,000
1952-1953	380	509,000
1953-1954	357	528,000
1954-1955	353	540,000
1955-1956	347	520,000
1956-1957	302	457,000
1957-1958	245	362,500
1958-1959 (estimated)	194	287,333

Medicine is a high priority item in the program of the commission. WICHE serves as a clearing house for a program whereby students from states without medical schools may attend medical schools in the area of the Western compact. Under this program, 85 medical students are crossing state borders this year to attend western medical schools. The student pays the regular in-state tuition; the sending state pays the receiving institution $2,000 per year in addition. The advantages run both ways—better educational opportunities for youth from "have-not" states and better financial support for existing medical schools.

In addition, WICHE is currently conducting a study of medical education needs and resources in the West. This comprehensive, region-wide study is under the immediate direction of Dr.

Dayton McKean of the University of Colorado Graduate School and will be reviewed by a representative advisory group before publication in 1958.

WICHE is active in related health science areas, notably nursing education and mental health training and research. In both areas, the commission has set up advisory councils, with representation from all over the West, to plan for a balanced growth—through complementary specialization of function—of Western professional and graduate education.

The New England Medical-Dental Education Program

Last February the New England Board of Higher Education proposed the New England Regional Medical-Dental Education Plan and recommended its adoption to the people of New England through their state legislatures. This plan is designed to assist and encourage the region's medical and dental schools in increasing the number of places for qualified New England students.

This action was taken because, in proportion to its population, fewer people from this region are entering these programs than from the nation as a whole. New England is not producing enough doctors and dentists from among its own residents to meet its own needs.

THE REGIONAL PLAN: Each New England medical school receives from funds appropriated to the Board from each of the participating states $2,500 per year for each student it enrolls from each state in excess of the number it enrolled from that state in 1956. This amount represents somewhat less than the average difference between what the student pays each year and the actual cost of instruction. Similarly, each dental school receives $1,500 and each state appropriates $1,500 for each student enrolled in excess of the number enrolled in 1956.

The plan has thus far been adopted by Maine, New Hampshire, Vermont, and Massachusetts. Supporting funds in amounts suggested by the Board were appropriated in these states except for New Hampshire, where a smaller amount was provided. The appropriations were: Massachusetts, $100,000; Maine, $20,000; New Hampshire, $8,000; and Vermont, $7,500. The sum recommended for Vermont was lower than for the others since under the plan that state, which supports its own medical school with tax funds, does not reimburse the University of Vermont for additional Vermont students.

The Board adopted a definition of residence based on those used by several publicly supported medical schools. During the past year an individual residence certificate was filed with the Board for every student enrolled in each of the region's medical and dental schools as of October, 1956, and for all students for whom New England residence was claimed as of October, 1957. The schools also have submitted certified class lists and statements of enrollment.

PROBLEMS OF RESIDENCE: When the given definition of residence was applied, the total number of New Englanders enrolled in 1956 was less than that reported earlier by the medical schools in an informal survey. Although many married students claim residence in the state in which they attend medical school, they do not merit this classification. Tabulation of the individual residence cards revealed that the number of residents enrolled in 1956 was 953, rather than 972, as was reported in the earlier survey.

IMPACT OF THE PLAN: The NEBHE plan was recommended by the Board last February and was not adopted by the state legislatures until several months later. Since by that time the incoming freshman classes had already been selected, the initial impact of the plan has not yet been felt. It will be a few years before its full effect can be ascertained.

COMPARATIVE ENROLLMENTS, *1956-1957:* The number of New England students in the region's medical schools in 1957 was 923 as compared with 953 for 1956, a 3.2% decrease.

The number enrolled in the dental schools increased from 333 to 345, a 3.7% increase.

In the medical schools there were increases for New Hampshire (8) and Rhode Island (1) and decreases for Connecticut (4), Maine (14), Massachusetts (20), and Vermont (1).

In dental schools there was a decrease for Connecticut (3) and increases for Maine (1), Massachusetts (2), New Hampshire (3), Rhode Island (4), and Vermont (5).

Four schools showed an increase of New England students: Dartmouth Medical School, 1; Harvard University School of Dental Medicine, 5; University of Vermont College of Medicine, 6; and Tufts University School of Dental Medicine, 7. Four enrolled fewer than last year: Boston University School of Medicine, 4; Harvard Medical School, 6; Tufts University School of Medicine, 21; and Yale University School of Medicine, 6.

FINANCIAL CONSIDERATIONS: Under the plan, payments are now due certain schools for enrolling a larger number of students from the four states which have adopted the plan, and the Board is now collecting and disbursing the funds.

The payments due from states which have joined the plan are: Maine, $5,500; Massachusetts, $41,500; New Hampshire, $29,500; Vermont, $10,000; and total, $86,500. However, since New Hampshire appropriated only $8,000, this amount will be prorated, and the schools will receive only 27% of the total due from that state.

SERIOUS CONDITIONS: Two serious conditions are already apparent. Since the number of bona fide residents in New England medical schools is smaller

than was assumed, the enrollment of New Englanders in all schools in the country is probably less favorable than was previously supposed. Second, in most of the region's medical and dental schools New England residents are in competition for places with the best students from all over the country. Gaining admission at a time when facilities are limited will become increasingly less favorable for many qualified New England students than for those who live in states where sizable public institutions give first preference to their own residents and other regional students. A total decrease of 3.2% in one year is serious, and, in the case of Maine, the decrease of 14 students or 22.6% would seem to indicate a very critical situation.

If such conditions persist, it may be necessary for some New England states to consider additional plans so that qualified students will have opportunities equal to those in other sections of the country and so that future health needs of their residents will be met.

THE NATIONAL SOCIETY FOR MEDICAL RESEARCH

For a number of years the National Society for Medical Research has played a very important role in improving public understanding of the principles, methods, and needs of the biological and medical sciences. Its activities have become widely recognized, and its contributions to medical education, research, and medical care are of constantly increasing significance.

The following résumé describing the functions of the National Society for Medical Research has been prepared by its staff for this issue of the education number of THE JOURNAL.

The National Society for Medical Research founded in 1946 by America's medical colleges to deal with a symptom of public ignorance and misunderstanding of medical and biological science—the antivivisection movement—now functions to treat the disease itself. At first the society was wholly occupied with the stop-gap protection of animal research against immediate threats of legal prohibition and general harassment of medical laboratories by the antivivisection movement. This effort was quickly successful, and soon the society was able to turn a large portion of its capacity to long-range public education—though crises continue to arise from time to time.

There are many symptoms of public misunderstanding of medical science—superstition, quackery, resistance to inoculation, militant antidissection and antiexperimentalist movements, ignorance, and apathy toward the needs and problems of scientific research.

In attacking the disease, the NSMR administers preventive medicine in two principal ways. First, the society starts chain-reaction educational projects. For example, through the American College Public Relations Association the old blockade against full reporting of the role of animals in research was, for the most part, swept away. Use of animals in research ceased to be a dark and sinister secret.

Second, the NSMR initiated positive action programs to help medical science. The society formulated a model statute for the utilization of unwanted dogs and cats ordinarily killed in public dog pounds. Today three out of four medical schools in the United States receive their needed dogs and cats from this source.

The society instigated the $4,000,000 worth of libel suits against the Hearst press that helped end the Hearst campaign against experimental medicine.

The society gave assistance in forming the Animal Care Panel, an organization devoted entirely to the exchange of technical information on the care of laboratory animals.

Last year a committee of the NSMR began formulating plans for a national conference on the legal environment of medical science. Because of the hodge-podge of laws affecting medical science in the various states, the conference, scheduled for the spring of 1959, will aim toward producing a Uniform Legal Code for the Medical Sciences. Included in the model code will be laws governing property rights in dead human bodies and provisions for bequests of whole bodies or parts for bioanatomical studies and for the transplants of organs. Laws governing animal experimentation and disposition of unclaimed animals will also be part of the model code.

The conference will be the basis for extensive publicity on the practical problems and needs of medical science.

The National Society for Medical Research is supported by the medical schools, by virtually all of the professional organizations in medicine and biology, and by commercial organizations concerned with medical research. The society's work is public education. Its purpose is to expedite medical progress.

MEDICAL SCHOOLS

APPROVED AND NEWLY DEVELOPING MEDICAL SCHOOLS

Table 12 lists by states the approved four year medical schools and schools of basic medical sciences, indicating for each school, public or private ownership, year of organization, tuition charges, enrollment by class and other basic data. Similar data is presented in the same table for the newly developing schools and in table 13 for Canadian schools.

In the 1957-1958 academic year, there was no change in the number of approved four year medical schools in the United States (78) or Canada (12). There remain four approved schools of basic medical sciences in the United States while all of

TABLE 12.—*Approved Medical Schools and Schools of the Basic Sciences in the United States*

State	No.		Ownership	Year Organized	Tuition		Premedical Requirement by Year	Students by Classes, 1957-1958 (Full-Time, Part-time, & Special Students Included)					Part-Time & Special Students†	Graduates 7/1/57 to 6/30/58		
					Resident	Non-resident		1st Yr.	2nd Yr.	3rd Yr.	4th Yr.	Total				
Ala.	1	Medical College of Alabama, Birmingham	Pub.	1859	$ 445.00	$ 845.00	100 S.H.*	81	71	68	69	289	3	68	Robert C. Berson, M.D., Dean	1
Ark.	2	University of Arkansas School of Medicine, Little Rock	Pub.	1879	380.00	None	3	93	93	74	85	345	2	85	F. Douglas Lawrason, M.D., Dean	2
Calif.	3	College of Medical Evangelists, Loma Linda, Los Angeles	Pri.	1909	1,250.00	1,250.00	3	112	94	82	96	384	15	96	Walter E. Macpherson, M.D., Dean	3
	4	University of California School of Medicine, Los Angeles	Pub.	1951	350.00	600.00	4	49	50	48	48	195	0	47	Stafford Warren, M.D., Dean	4
	5	University of Southern California School of Medicine, Los Angeles	Pri.	1885	1,150.00	1,150.00	3	67	67	69	61	264	0	60	Clayton G. Loosli, M.D., Dean	5
	6	Stanford University School of Medicine, San Francisco	Pri.	1908	1,005.00	1,005.00	3	62	61	57	54	234	1	54	Robert H. Alway, M.D., Dean	6
	7	University of California School of Medicine, San Francisco	Pub.	1864	350.00	600.00	3	79	81	81	83	324	0	82	John R. det. Saunders, M.D., Dean	7
Colo.	8	University of Colorado School of Medicine, Denver	Pub.	1883	655.00	1,055.00	3	85	70	86	77	318	0	79	Robert J. Glaser, M.D., Dean	8
Conn.	9	Yale University School of Medicine, New Haven	Pri.	1812	1,025.00	1,025.00	3	79	80	78	72	309	3	72	Vernon Lippard, M.D., Dean	9
D.C.	10	Georgetown University School of Medicine, Washington	Pri.	1851	1,000.00	1,000.00	3-4	108	106	93	100	407	0	100	Hugh H. Hussey, M.D., Dean	10
	11	George Washington University School of Medicine, Washington	Pri.	1825	1,000.00	1,000.00	3	101	101	91	90	383	1	90	John L. Parks, M.D., Dean	11
	12	Howard University College of Medicine, Washington	Pri.	1868	591.75	591.75	3	103	73	77	67	320	3	67	Robert S. Jason, M.D., Dean	12
Fla.	13	University of Miami School of Medicine, Coral Gables	Pri.	1952	800.00	1,500.00	3	79	64	62	60	265	0	60	Homer F. Marsh, Ph.D., Dean	13
Ga.	14	Emory University School of Medicine, Emory University	Pri.	1854	1,000.00	1,000.00	3	74	71	67	66	278	3	66	Arthur P. Richardson, M.D., Dean	14
	15	Medical College of Georgia, Augusta	Pub.	1828	455.00	None	3	103	95	93	95	386	6	93	Harry B. O'Rear, M.D., Dean	15
Ill.	16	Chicago Medical School	Pri.	1912	672.00	672.00	4	73	71	64	67	275	0	65	John J. Sheinin, M.D., President	16
	17	Northwestern University Medical School, Chicago	Pri.	1859	945.00	945.00	3	130	123	135	131	519	0	131	Richard H. Young, M.D., Dean	17
	18	Stritch School of Medicine of Loyola University, Chicago	Pri.	1915	800.00	800.00	3	88	86	88	75	337	0	73	John F. Sheehan, M.D., Dean	18
	19	University of Chicago, The School of Medicine	Pri.	1927	1,000.00	1,000.00	3	72	73	74	69	288	0	70	Lowell T. Coggeshall, M.D., Dean Division of Biological Sciences	19
	20	University of Illinois College of Medicine, Chicago	Pub.	1881	343.50	763.50	3	190	179	158	150	677	0	150	Granville A. Bennett, M.D., Dean	20
Ind.	21	Indiana University School of Medicine, Bloomington, Indianapolis	Pub.	1903	630.00	750.00	3	158	146	139	140	583	0	138	John D. Van Nuys, M.D., Dean	21
Iowa	22	State University of Iowa College of Medicine, Iowa City	Pub.	1850	400.00	800.00	3	120	110	99	105	434	2	104	Norman B. Nelson, M.D., Dean	22
Kans.	23	University of Kansas School of Medicine, Lawrence, Kansas City	Pub.	1905	475.00	925.00	4	102	96	107	107	412	2	107	W. Clarke Wescoe, M.D., Dean	23
Ky.	24	University of Louisville School of Medicine	Pub.	1837	300.00	1,300.00	3	103	97	87	95	382	5	95	J. Murray Kinsman, M.D., Dean	24
La.	25	Louisiana State University School of Medicine, New Orleans	Pub.	1931	150.00	150.00	3	135	103	111	95	444	4	95	William W. Frye, M.D., Dean	25
	26	Tulane University of Louisiana School of Medicine, New Orleans	Pri.	1834	1,100.00	1,100.00	3	134	121	120	128	503	2	128	Maxwell E. Lapham, M.D., Dean	26
Md.	27	Johns Hopkins University School of Medicine, Baltimore	Pri.	1893	1,280.00	1,280.00	Degree	74	71	73	75	293	0	75	Thomas B. Turner, M.D., Dean	27
	28	University of Maryland School of Medicine & College of Physicians and Surgeons, Baltimore	Pub.	1807	765.00	915.00	3	93	99	85	78	355	0	78	William S. Stone, M.D., Dean	28
Mass.	29	Boston University School of Medicine	Pri.	1873	1,000.00	1,000.00	3	74	78	67	72	291	0	71	Chester S. Keefer, M.D., Dean	29
	30	Harvard Medical School, Boston	Pri.	1783	1,068.00	1,068.00	2	114	115	148	135	512	0	135	George Packer Berry, M.D., Dean	30
	31	Tufts University School of Medicine, Boston	Pri.	1893	1,015.00	1,015.00	3	114	102	105	109	430	1	109	Joseph M. Hayman Jr., M.D., Dean	31
Mich.	32	University of Michigan Medical School, Ann Arbor	Pub.	1850	550.00	900.00	3	190	183	190	171	734	8	169	A. C. Furstenberg, M.D., Dean	32
	33	Wayne State University College of Medicine, Detroit	Pub.	1885	537.00	981.00	3	75	68	67	72	282	1	72	Gordon H. Scott, Ph.D., Dean	33
Minn.	34	University of Minnesota Medical School, Minneapolis	Pub.	1883	460.00	900.00	3	131	124	130	114	499	6	113	Robert B. Howard, M.D., Dean	34
Miss.	35	University of Mississippi School of Medicine, Jackson	Pub.	1903	600.00	825.00	3	80	60	63	44	253	0	44	David S. Pankratz, M.D., Dean	35
Mo.	36	University of Missouri School of Medicine, Columbia	Pub.	1840	Fees—No Tuition 355.00 498.00	None	3	75	65	31	35	206	5	32	Roscoe L. Pullen, M.D., Dean	36
	37	Saint Louis University School of Medicine	Pri.	1903	1,000.00	1,000.00	3	121	110	119	117	467	8	117	James W. Colbert Jr., M.D., Dean	37
	38	Washington University School of Medicine, St. Louis	Pri.	1899	924.00	924.00	3	86	82	88	88	344	0	87	Oliver H. Lowry, M.D., Dean	38
Neb.	39	Creighton University School of Medicine, Omaha	Pri.	1892	912.00	912.00	3	77	67	74	65	282	0	64	F. G. Gillick, M.D., Dean	39
	40	University of Nebraska College of Medicine, Omaha	Pub.	1881	765.00	765.00	3	87	87	75	88	337	2	88	James P. Tollman, M.D., Dean	40
N.Y.	41	Albany Medical College of Union University	Pri.	1839	1,012.00	1,012.00	3	63	55	51	60	229	0	60	Harold C. Wiggers, Ph.D., Dean	41
	42	University of Buffalo School of Medicine	Pri.	1846	1,080.00	1,080.00	3	84	84	70	78	316	6	78	Ernest Witebsky, M.D., Acting Dean	42
	43	Columbia University College of Physicians and Surgeons, New York City	Pri.	1767	1,183.00	1,183.00	3	120	117	118	115	470	0	115	Howard C. Taylor Jr., M.D., Dean	43
	44	Cornell University Medical College, New York City	Pri.	1898	1,250.00	1,250.00	3	84	86	87	87	334	0	81	John E. Deitrick, M.D., Dean	44
	45	New York Medical College, Flower & Fifth Avenue Hospitals, New York City	Pri.	1860	1,050.00	1,050.00	4	128	130	124	115	497	0	115	Ralph E. Snyder, M.D., Dean	45
	46	New York University College of Medicine, New York City	Pri.	1841	1,117.00	1,117.00	3	134	133	129	125	519	1	125	Donal Sheehan, M.D., Dean	46
	47	State University of New York, Downstate Medical Center, New York City	Pub.	1860	715.00	715.00	3	153	148	142	146	589	1	145	Robert A. Moore, M.D., Dean	47
	48	University of Rochester School of Medicine and Dentistry	Pri.	1920	1,000.00	1,000.00	3	71	69	69	74	283	1	73	Donald G. Anderson, M.D., Dean	48
	49	State University of New York, Upstate Medical Center, Syracuse	Pub.	1834	715.00	715.00	3	80	75	68	73	300	7	71	Carlyle Jacobsen, Ph.D., Dean	49
N.C.	50	University of North Carolina School of Medicine, Chapel Hill	Pub.	1879	671.00	1,271.00	3	69	69	61	58	257	1	58	W. Reece Berryhill, M.D., Dean	50
	51	Duke University School of Medicine, Durham	Pri.	1930	1,020.00	1,020.00	3	79	76	79	81	315	5	81	Wilburt C. Davison, M.D., Dean	51
	52	Bowman Gray School of Medicine of Wake Forest College, Winston-Salem	Pri.	1902	825.00	825.00	3	54	51	50	49	204	1	49	Coy C. Carpenter, M.D., Dean	52
Ohio	53	University of Cincinnati College of Medicine	Pub.	1819	700.00	900.00	3	93	91	87	77	348	0	76	Stanley E. Dorst, M.D., Dean	53
	54	Western Reserve University School of Medicine, Cleveland	Pri.	1843	1,000.00	1,000.00	3	82	86	80	77	325	5	77	Joseph T. Wearn, M.D., Dean	54
	55	Ohio State University College of Medicine, Columbus	Pub.	1914	630.00	None	4	150	142	142	138	572	25	139	Charles A. Doan, M.D., Dean	55
Okla.	56	University of Oklahoma School of Medicine, Oklahoma City	Pub.	1900	500.00	1,000.00	3	100	95	94	83	372	0	83	Mark R. Everett, Ph.D., Dean	56

Ore.	57	University of Oregon Medical School, Portland	Pub.	1887	570.00	843.00	3	79	65	77	71	292	19	70	D. W. E. Baird, M.D., Dean	57
Pa.	58	Hahnemann Medical College and Hospital of Philadelphia	Pri.	1848	922.00	922.00	3	106	96	94	98	394	0	98	Charles Cameron, M.D., Dean	58
	59	Jefferson Medical College of Philadelphia	Pri.	1825	882.50	882.50	3	176	167	177	160	682	0	158	William A. Sodeman, M.D., Dean	59
	60	Temple University School of Medicine, Philadelphia	Pri.	1901	900.00	900.00	3	126	121	120	118	485	2	118	William N. Parkinson, M.D., Dean	60
	61	University of Pennsylvania School of Medicine, Philadelphia	Pri.	1765	1,000.00	1,000.00	3	128	125	130	126	509	1	126	John McK. Mitchell, M.D., Dean	61
	62	Woman's Medical College of Pennsylvania, Philadelphia	Pri.	1850	1,075.00	1,075.00	3	51	47	41	46	185	0	45	Marion Fay, Ph.D., Dean	62
	63	University of Pittsburgh School of Medicine	Pri.	1862	1,048.00	1,048.00	3	102	97	85	81	365	0	80	Francis S. Cheever, M.D., Dean	63
Puerto Rico	64	University of Puerto Rico School of Medicine, San Juan	Pub.	1949	558.00	558.00 to 710	3	53	44	46	45	188	1	45	E. Harold Hinman, M.D., Dean	64
S.C.	65	Medical College of South Carolina, Charleston	Pub.	1823	592.50	Freshmen 592.50	2	80	75	75	75	305	0	75	John T. Cuttino, M.D., Dean	65
Tenn.	66	University of Tennessee College of Medicine, Memphis	Pub.	1851	567.00	912.00	3	220	196	172	180	768	3	192	Maston Kennerly Callison, M.D., Dean	66
	67	Meharry Medical College, Nashville	Pri.	1876	794.00	794.00	3 Bachelor's or Senior In Absentia	73	66	69	59	267	3	57	Daniel T. Rolfe, M.D., Dean	67
	68	Vanderbilt University School of Medicine, Nashville	Pri.	1873	1,040.00	1,040.00	In Absentia	52	50	48	46	197	2	46	John W. Patterson, M.D., Dean	68
Tex.	69	University of Texas Southwestern Medical School, Dallas	Pub.	1943	300.00	None	3	104	96	96	97	388	7	90	Atticus J. Gill, M.D., Dean	69
	70	University of Texas Medical Branch, Galveston	Pub.	1887	350.00	None	90 S.H.*	132	134	130	131	527	0	131	John B. Truslow, M.D., Dean	70
Utah	72	Baylor University College of Medicine, Houston	Pri.	1900	897.50	897.50	3	80	82	75	78	315	17	78	Stanley W. Olson, M.D., Dean	71
Vt.	73	University of Utah School of Medicine, Salt Lake City	Pub.	1905	480.00	480.00	3	58	52	49	48	207	1	48	Philip B. Price, M.D., Dean	72
Va.	74	University of Vermont College of Medicine, Burlington	Pub.	1822	595.00	1,045.00	Degree	51	49	41	58	179	5	38	George A. Wolf, M.D., Dean	73
	75	University of Virginia School of Medicine, Charlottesville	Pub.	1825	514.00	964.00	3	77	72	75	66	290	0	66	Thomas Harrison Hunter, M.D., Dean	74
	76	Medical College of Virginia, Richmond	Pub.	1838	671.00	1,021.00	3	85	79	97	96	357	0	97	William F. Mahoney, M.D., Dean	75
Wash.	70	University of Washington School of Medicine, Seattle	Pub.	1945	458.00	768.00	3	75	69	72	72	288	1	72	George N. Aagaard, M.D., Dean	76
Wis.	77	University of Wisconsin Medical School, Madison	Pub.	1907	390.00	730.00	3	90	87	72	76	320	16	76	John Z. Bowers, M.D. Dean	77
	78	Marquette University School of Medicine, Milwaukee	Pri	1913	950.00	950.00	4	105	93	99	96	393	6	98	John S. Hirschboeck, M.D., Dean	78
		Totals						7,651	7,164	7,009	6,888	28,702	229	6,861		
		Approved Schools of Basic Medical Sciences														
							Bachelor's or 3 Yrs. Candidacy For									
N.H.	1	Dartmouth Medical School, Hanover	Pri.	1797	1,170.00	1,170.00	Bachelor's	74	74	...	...	48	0	0	Rolf C. Syvertsen, M.D., Dean	1
N.D.	2	University of North Dakota School of Medicine, Grand Forks	Pub.	1905	178.00	436.00	3	40	38	...	...	78	2	0	Theodore H. Harwood, M.D., Dean	2
S.D.	3	State University of South Dakota School of Medicine, Vermillion	Pub.	1907	320.00	600.00	3	46	34	...	...	80	4	0	W. L. Hard, Ph.D., Dean	3
W.Va.	4	West Virginia University School of Medicine, Morgantown	Pub.	1902	300.00	700.00	3	40	30	...	...	70	0	0	Edward J. Van Liere, M.D., Dean	4
		Totals						150	126	...	...	276	6	0		
		Totals						7,801	7,290	7,009	6,888	28,979	235	6,861		
		Schools Developing New Programs:														
Fla.	1	University of Florida College of Medicine, Gainesville	Pub.	1956	600.00	1,200.00	4	51	41	...	...	92	0	0	George T. Harrell, M.D., Dean	1
N.J.	2	Seton Hall College of Medicine and Dentistry, Jersey City	Pri.	1956	950.00	950.00	3	80	77	...	...	157	0	0	Charles L. Brown, M.D., Dean	2
N.Y.	3	Albert Einstein College of Medicine of Yeshiva University, New York City	Pri.	1955	1,050.00	1,050.00	4	98	96	57	...	245	0	0	Marcus D. Kogel, M.D., Dean	3
		Totals						229	214	51	...	494	0	0		
		Grand Totals						8,030	7,504	7,051	6,888	29,473	235	6,861		

* S.H.—Semester hours

† Part time and special students included in enrollment figures.

‡ Provisionally approved on the basis of full implementation of the first two years' program.

Tuition	
University of California, L.A. University of California, S.F. University of Colorado College of Medical Evangelists University of Oregon University of Utah University of Washington	Residents of Arizona, Idaho, Montana, New Mexico, Wyoming, and Alaska who enroll under the Western Interstate Commission for Higher Education's student exchange program will pay the standard resident tuition.

Medical College of Georgia: Tuition includes breakage deposit, health, and activities fees.
Nonresident students of other approved medical schools are considered for advanced standing.
The nonresident tuition and fees are $755.

University of Michigan: Tuition subject to change.

Medical College of South Carolina: Non resident students of other approved medical schools are considered for advanced standing.
Nonresident tuition and fees are $1,592.50.
Premedical Requirement by Year

Cornell University: Three years, if degree will be granted in absentia.

Dartmouth Medical School: Bachelor's degree or three years and candidacy for the bachelor's degree.

University of Louisville: Degree preferred. Otherwise senior in absentia.

Vanderbilt University: Bachelor's degree or senior in absentia.

Vermont University: Four years and a Bachelor's degree.

Western Reserve University: Three years minimum.
Four years preferred.

Woman's Medical College: Four years preferred.

Baylor University: Four years with degree strongly preferred.

Bowman Gray School of Medicine: Degree strongly recommended.

Ohio State University: Four years or Arts & Medicine.

the Canadian schools present a full four-year program. It is anticipated that one of the schools of basic medical sciences, West Virginia University School of Medicine, will enroll students in the third-year class in its now developing clinical facilities by 1960. It will be eligible for approval as a four-year institution during 1961-1962.

Of the newly developing medical schools, the initial class at Albert Einstein College of Medicine has completed three years of study, while initial classes at the University of Florida College of Medicine and Seton Hall College of Medicine and Dentistry have completed their first two years of medical study. Provisional approval was granted Albert Einstein in the academic year 1956-1957; the University of Florida and Seton Hall were granted similar approval during this past year.

The University of Kentucky School of Medicine is the only other medical school presently undergoing active development. It is expected that the first class will enter this institution in the fall of 1960.

new construction, the completion of construction, or the commitment of funds for construction to be initiated during 1958-1959. Thirty United States schools indicated the initiation of 41 construction projects, 26 United States schools completed construction of 29 projects, and 28 United States schools have funds committed for 35 projects with construction to begin in 1958-1959. One project was initiated by a Canadian school, five were completed at four schools, and in two institutions funds are committed for projects with construction to begin in 1958-1959. Table 14 presents estimates of construction and equipment costs for these projects.

Major construction completed during the past year in the United States includes seven new facilities or expansion and/or renovation of old facilities primarily for research, eight primarily for teaching, four clinical facilities, and three student dormitories. Howard and Indiana completed new basic science buildings and SUNY Syracuse completed a substantial addition to its old building which was also renovated.

TABLE 13.—*Approved Medical*

Province	Approved Medical Schools	Year Organized	Tuition: Resident	Tuition: Nonresident	Premedical Requirement*
Alta.	1 University of Alberta Faculty of Medicine, Edmonton	1913	$391.25(1) 501.25(2) 551.25(3-4)	Same	3
B.C.	2 University of British Columbia, School of Medicine, Vancouver	1949	445.00	Same	3
Man.	3 University of Manitoba Faculty of Medicine, Winnipeg	1883	531.00	Same	3
N.S.	4 Dalhousie University Faculty of Medicine, Halifax	1867	531.00	731	3
Ont.	5 Queen's University Faculty of Medicine, Kingston	1854	395.00-A† 545.00-B	Same	1‡
	6 University of Western Ontario Faculty of Medicine, London	1881	585.00	Same	3
	7 University of Ottawa Faculty of Medicine, Ottawa	1945	534.00	834	1‡
	8 University of Toronto Faculty of Medicine, Toronto	1843	591.50(1-2-3) 691.50(4)	Same	1‡§
Que.	9 McGill University Faculty of Medicine, Montreal	1829	750.00	Same	3‖
	10 University of Montreal Faculty of Medicine, Montreal	1843	545.00	620	Degree
	11 Laval University Faculty of Medicine, Quebec	1852	520.00	Same	Degree
Sask.	12 University of Saskatchewan College of Medicine, Saskatoon	1926	472.00(1) 522.00(2-3-4)	Same	3
	Totals				

* Number of premedical years required after Junior matriculation in high school for admission to medical school.
† A, premedicine; B, medicine.
‡ In the case of Queen's Ottawa, and Toronto, where years of premedical college work is under the Faculty of Medicine in addition to the four years of medical school itself, the figure given admits to the first premedical college year of the faculty. To enter the four-year medical school program directly, two years of college are needed in addition to the figure given.
§ Degree in arts and sciences if college work is taken elsewhere.
‖ A very definite preference is given to those who have baccalaureate degrees.
¶ Intern and premedical figures not included.

There has been an initial or continuing interest expressed in the potentiality of constructing new medical schools in Connecticut (Hartford as part of the University of Connecticut); Texas (San Antonio or Austin as part of the University of Texas); Arizona, Idaho, and Massachusetts (Boston as part of Massachusetts Institute of Technology). In the latter three instances initial interest appears to be directed toward the possibility of developing two year schools of basic medical sciences. Early but perhaps less well-formulated interest in the development of new medical schools is present in New York, Philadelphia, and Illinois.

CONSTRUCTION OF FACILITIES

During the year 1957-1958 there was an unusual amount of construction activity as 60 United States and 5 Canadian schools reported the initiation of

Major construction initiated includes 15 new facilities or expansion and/or renovation of old facilities primarily for research, seven primarily for teaching, seven clinical facilities, and five student dormitories. Stanford initiated construction of its new basic science building and hospital in Palo Alto in anticipation of moving the medical school from San Francisco to the University campus. Johns Hopkins began construction of a new basic science building. The new hospital at West Virginia was begun anticipating expansion of the school to include the full four-year program.

Major construction planned for initiation in 1958-1959 with funds already committed includes 19 new facilities or expansion and/or renovation of old facilities primarily for research, eight primarily for teaching, seven clinical facilities, and two student dormitories. Tulane will begin construction

of a large teaching and research building that will bring all departments together on one campus. Wayne plans to begin building a new basic science facility. New York University will get construction under way for its new hospital and Utah will undertake the construction of a new medical center building.

In Canada, Alberta completed a substantial expansion of its basic science building; British Columbia completed a pathology building and will begin construction of a new basic science building in the forthcoming year; and McGill will initiate construction of the first unit of its new medical center.

MEDICAL SCHOOL EXPENDITURES

In last year's report on Medical Education in the United States and Canada, specific quantitative data on medical school expenditures were not presented because of lack of assurance in regard to the completeness and validity of the information solicited in the annual questionnaire that serves as the basis for much of the material in these reports. There continues to be a need for a clearer concept of medical school costs. Because of his experience and continuing interest, Mr. A. J. Carroll,* Business Officer, State University of New York Upstate Medical Center, was asked to design the question dealing with medical school expenditures in this year's questionnaire. Mr. Carroll framed a question which solicited from each school actual expenditures for 1956-1957 and estimated expenditures for 1957-1958 under each of the items listed in table 15.

The data in table 15 are presented with more assurance in regard to completeness but nonetheless with considerable reserve as to the accuracy with which they present total medical school costs or estimates of costs. Because these figures have a different base than financial data presented in previous reports, they cannot and should not be compared with what superficially may appear to be similar cost figures in reports of other years.

The greatest doubt as to the accuracy in reflecting the grand totals of actual and estimated expenditures is the lack of uniform practices and terminology. For example, there is no generally accepted method within medical schools of accounting for direct costs of patient care in teaching hospitals. Undoubtedly in certain instances some such costs are included, and in others they are not a part of the individual school sums that are reflected in these totals.

In table 15 with each item there is an indication of the number of schools which reported sums under that item and the composite of which represents the total for that item. It is to be emphasized that the number of schools reporting under a given item reflects a mixture of both schools expending funds from that source and also accounting procedures that result in the expenditure of those funds being identified under that heading. One of many possible examples is cited for clarification. All schools receive funds from students as payment of charges for tuition and fees (*j*), yet 30 schools report no expenditure of funds under this item. Of the private schools not reporting, the expenditure would most always be included under the item for general university funds (*h*). Of the state schools not reporting, the expenditure could be and in some instances is included under general university funds (*h*), state appropriation (*f*) or state subsidy (*g*).

Under these circumstances, the data cannot be broken down validly to indicate the percentage of total expended funds that originated in any listed source. The sums presented under actual expenditures for 1956-1957 and estimated expenditures for 1957-1958, however, are based on sufficiently similar accounting practices within each school to make certain comparisons feasible.

Schools in Canada

1st Pre-medical Year	2nd Pre-medical Year	1st Year	2nd Year	3rd Year	4th Year	Required Intern Year	Total	Part Time and Irregular Student	Graduates 5-1-57 to 6-30-58		
0	0	58	52	59	45	0	214	0	47	John W. Scott, M. D., Dean	1
0	0	61	57	49	47	0	214	0	47	H. Rocke Robertson, M. D., Acting Dean	2
0	0	70	51	60	45	0	226	0	45	Lennox G. Bell, M. D., Dean	3
0	0	61	59	51	52	56	229	0	56	C. B. Stewart, M. D., Dean	4
57	53	61	58	58	46	0	229	0	45	G. Shrold Ettinger, M. D., Dean	5
0	0	63	55	54	57	0	229	0	57	J. B. Collip, M. D., Dean	6
16	35	72	64	59	42	0	287	0	36	Jean-Jacques Lussier, M. D., Dean	7
131	121	160	149	147	123	0	570	0	119	J. A. MacFarlane, M. D., Dean	8
0	0	116	101	107	110	0	434	0	108	Lloyd G. Stevenson, M. D., Dean	9
0	0	121	110	107	103	0	441	0	113	Wilfrod Bonin, M. D., Dean	10
0	0	135	131	141	122	121	650	0	119	Jean-Baptiste Jobin, M. D., Dean	11
0	0	34	29	36	38	0	137	2	36	J. Wendell Macleod, M. D., Dean	12
204	209	1,012	916	928	830	177	3,686	2	858		

TABLE 14.—*Estimates of Costs for Construction of Facilities*

	Estimated Construction Cost	Estimated Equipment Cost	Total
United States Schools, 1957-1958			
Construction Initiated	$63,660,000	$10,310,000	$ 73,970,000
Construction Completed	37,450,000	4,520,000	41,970,000
Construction Planned*	90,355,000	11,000,000	101,355,000
Canadian Schools, 1957-1958			
Construction Initiated	1,000,000	340,000	1,340,000
Construction Completed	5,530,000	270,000	5,800,000
Construction Planned†	4,300,000	250,000	4,550,000

* Funds already committed and construction planned for 1958-1959.
† Some schools reported equipment costs as part of construction costs.

Expenditures estimated for 1957-1958 were 13% greater (32 million dollars) than actual expenditures for 1956-1957. Increments greater than the estimated 13% in total expenditures are found in items for endowment income (*i*) 20%, grants and gifts for teaching (*c* and *d*) 19%, state appropriation (*f*) 19%, teaching expenses paid from medical service funds (*m*) 18%, overhead on grants (*k*) 17%, and grants and gifts for research (*a* and *b*) 16%. Estimates of expenditures from all other items (*e*, *g*, *h*, *j*, *l*, *n*, and *o*) are of a lesser increase than that estimated for the total.

TABLE 15.—*Medical School Expenditures**

Sources of Funds	Number of Schools Reporting Item	Actual Expenditures, 1956-1957	Number of Schools Reporting Item	Estimated Expenditures, 1957-1958
(a) Federal grants for research	85	$ 45,646,376.75	85	$ 56,021,273.85
(b) Nongovernment gifts and grants for research	83	29,040,287.73	82	31,437,060.33
Subtotal, items a & b		$ 74,686,664.48		$ 87,458,367.18
(c) Federal grants for teaching	81	11,043,755.04	81	13,845,490.79
(d) Nongovernment gifts and grants for teaching	61	7,463,321.60	61	8,158,866.97
Subtotal, items c & d		$ 18,507,076.64		$ 22,004,396.76
(e) Unrestricted gifts & grants	58	6,508,702.56	58	6,976,573.66
(f) State, county, or city appropriation for defrayal of medical school expenses	41	40,983,688.74	41	47,734,431.87
(g) State, county, or city subsidies paid as reimbursement for medical school expenses	10	2,350,308.02	11	2,481,812.79
(h) General University Funds	49	31,704,843.29	48	30,730,751.75
(i) Endowment income	51	13,826,905.34	52	16,616,219.60
(j) Tuition and fees	55	16,055,102.66	57	17,514,008.39
(k) Overhead on grants	43	3,948,226.34	43	4,633,153.41
(l) Teaching expenses (Faculty and supporting staff salaries and related supplies) paid by hospitals and clinics	30	13,252,104.02	29	13,879,980.57
(m) Teaching expenses paid from medical service funds	21	3,831,831.68	21	4,653,361.55
(n) Costs of services and expenses provided by university (administrative, building & grounds, student health)	29	8,303,688.44	29	8,825,022.00
(o) Other	24	2,649,912.01	24	2,867,322.00
Grand Total (Items a through o)	85	$239,606,654.22	85	$272,375,402.53

* Please refer to text under this same title.

The total actual expenditure for the median four-year school in full operation for 1956-1957 was between $2.370 million and $2.443 million. The total estimated expenditure for the median four-year school in full operation for 1957-1958 was between $2,871,000 and $2,877,000. The estimated total increase in expenditures for the median school amounted to almost $500,000. The range of change between funds expended by all 85 schools in 1956-1957 and their estimated expenditures was from $600,000 to more than $1,400,000. Eighty schools estimated increased expenditures, and only five estimated lesser expenditures.

In 1956-1957, 33 of 85 schools expended less than 2 million dollars. In 1957-1958, 28 of the 85 schools estimated expenditures under 2 million dollars.

It is pertinent to again point out that data presented for medical school expenditures cannot with present knowledge be translated into costs of educating medical students—or indeed any other single function of medical schools. These meaningful interpretations will be possible only when there is available a uniform, functional cost accounting system. The reader is referred to the section of this report on Medical School Financing for information in regard to a proposed study of medical school costs on this basis.

Canadian schools' expenditures are not presented since the returns from several schools did not contain adequate information.

FULL-TIME FACULTY POSITIONS IN THE UNITED STATES UNFILLED 1957-1958

Previous references elsewhere in this report have been made to the recognized needs for additional educational facilities in medicine to prepare increased numbers of physicians to provide health care to a rapidly expanding population. The creation of new and the expansion of existing medical schools pose difficult and serious problems in relation to site selection, construction of facilities, and financing. However, even if these problems were resolved and additional facilities were now available, they would be of limited value without adequate numbers of competent faculty.

The number of budgeted full-time faculty positions unfilled in 1957-1958 are presented in table 16. These data should excite real concern in all individuals interested in maintaining high standards in medicine for they reflect a sharp increase in what was before only a suggestive upward trend in the numbers of unfilled faculty posts (table 17). Unless this trend is broken, it seems unlikely that additional physical resources in medical education will be able to be staffed effectively.

A comprehensive study undertaken by the National Academy of Sciences promises to cast considerable light on this problem. Some of the early available information from that study appears in this report under title of "National Academy of Sciences–National Research Council Study: Postdoctoral Education in the Medical Sciences and Research; A Preliminary Report."

Table 16 indicates that 32% of all the unfilled positions are newly created posts. The number of unfilled newly created posts last year represented a larger segment (45%) of last year's total vacancies.

* See section of report titled Medical School Financing.

This shift indicates that this problem is not primarily related to a change in the basic nature of the educational program.

In view of the growing size of the problem of faculty recruitment, it is heartening to note that enrollments in advanced degree programs in the basic medical sciences (see section under this title) are increased over last year, since students in these programs represent the most assured pool of future faculty for the basic science disciplines. However, this at best can result in providing only a part of the additional faculty members needed.

It is to be emphasized that the vacancies existing in faculty posts presented in table 16 reflect only the numbers of faculty personnel required to maintain medical education at today's qualitative level and to produce graduates of the present quantitative order. Higher educational standards will not be solely related to increasing numbers of full-time faculty. Almost surely augmented numbers of competent teaching personnel will be an important factor in attaining advanced educational levels. It is certain that expansion of educational opportunities in medicine to meet the physician needs of an enlarging population can occur without serious harm to the quality of medicine taught and therefore of medicine practiced, only with a concomitant expansion of the body of full-time faculty.

GRADUATE EDUCATION IN THE BASIC MEDICAL SCIENCES

Because of the importance of acquiring well-prepared teaching personnel in the basic medical sciences, the last few annual reports on Medical Education in the United States and Canada have included information about graduate programs offered in the basic medical sciences and the number of students enrolled in these programs. The sharp increase in the number of unfilled full-time faculty positions (table 17) makes this information

TABLE 16.—*Budgeted Unfilled Full-Time Faculty Positions in Medical Schools of the United States, 1957-1958*

	Newly Budgeted Positions, No.					Old Positions, No.					Old and New Positions, Total				
	Instructor	Assistant Professor	Associate Professor	Professor	Total	Instructor	Assistant Professor	Associate Professor	Professor	Total	Instructor	Assistant Professor	Associate Professor	Professor	Total
Basic Science Departments															
Anatomy	5	12	1	1	19	14	1	4	7	26	19	13	5	8	45
Biochemistry	2	3	1	0	6	7	6	4	5	22	9	9	5	5	28
Microbiology	2	7	0	2	11	8	12	6	4	30	10	19	6	6	41
Pathology	3	6	2	0	11	7	20	12	8	47	10	26	14	8	58
Pharmacology	2	6	2	0	10	8	6	6	2	22	10	12	8	2	32
Physiology	5	7	1	1	14	6	5	5	5	21	11	12	6	6	35
Subtotals	19	41	7	4	71	50	50	37	31	168	69	91	44	35	239
Clinical Departments															
Anesthesiology	5	1	0	2	8	8	3	2	3	16	13	4	2	5	24
Dermatology	0	0	0	0	0	0	2	1	1	4	0	2	1	1	4
Medicine	6	4	5	3	18	10	14	6	7	37	16	18	11	10	55
Neurology	0	2	1	1	4	0	0	2	1	3	0	2	3	2	7
Obstetrics & gynecology	4	4	1	2	11	6	7	0	4	17	10	11	1	6	28
Ophthalmology	0	1	0	0	1	2	2	2	2	8	2	3	2	2	9
Orthopedic surgery	2	0	0	0	2	3	4	3	1	11	5	4	3	1	13
Otolaryngology	3	0	0	1	4	1	2	2	3	8	4	2	2	4	12
Pediatrics	4	3	0	3	10	8	6	9	2	25	12	9	9	5	35
Physical medicine	2	2	1	2	7	1	1	0	1	3	3	3	1	3	10
Psychiatry	3	12	3	9	27	14	7	3	4	28	17	19	6	13	55
Public health & preventive medicine	4	5	2	1	12	6	8	12	6	32	10	13	14	7	44
Radiology	5	1	0	1	7	8	4	6	5	23	13	5	6	6	30
Surgery	5	4	3	1	13	10	6	10	5	31	15	10	8	11	44
Urology	1	0	0	0	1	0	1	1	2	4	1	1	1	2	5
Other Clinical Departments	0	0	0	0	0	3	0	0	2	5	3	0	0	2	5
Subtotals	44	39	16	26	125	80	67	59	49	255	124	106	70	80	380
Totals	63	80	23	30	196	130	117	96	80	423	193	197	114	115	619

TABLE 17.—*Budgeted Unfilled Full-Time Faculty Positions in the United States (1954-1955 to 1957-1958)*

	1954-1955	1955-1956	1956-1957	1957-1958
Anatomy	25	18	22	45
Biochemistry	9	8	17	28
Physiology	16	15	21	35
Pharmacology	16	19	17	32
Microbiology	14	15	18	41
Pathology	27	33	46	58
Subtotal	107	108	141	239
Medicine	23	28	29	55
Surgery	19	22	42	44
Pediatrics	15	12	21	35
Obstetrics & gynecology	14	16	13	28
Psychiatry	30	21	29	55
Preventive medicine	17	14	19	44
Radiology	11	8	...	30
Anesthesiology	5	10	6	24
Others	17	12	31	65
Subtotal	151	143	190	380
Totals	258	251	331	619

TABLE 18.—*Advanced Degree and Postdoctoral Programs*

United States	Programs and Enrollment																	
	Masters									Doctorates								
	Anatomy	Biochemistry	Biophysics	Microbiology	Pathology	Pharmacology	Physiology	Other	Total	Anatomy	Biochemistry	Biophysics	Microbiology	Pathology	Pharmacology	Physiology	Other	Total
Medical College of Alabama	4	5	..	2	✓	2	3	..	16	2	7	..	✓	..	1	2	..	12
University of Arkansas	..	13	..	1	..	3	1	..	18	..	..	..	..	..	1	1	..	2
College of Medical Evangelists	2	6	..	2	..	1	1	..	12	1	2	..	..	..	..	..	..	3
University of California, Los Angeles	2	✓	✓	5	..	7	1	..	15	13	14	6	5	..	✓	4	..	42
University of Southern California	✓	14	..	1	2	✓	16	..	33	✓	12	..	1	..	5	12	..	30
Stanford University	✓	✓	✓	3	..	✓	1	..	4	1	✓	✓	14	..	1	9	..	25
University of California, San Francisco	6	..	..	..	9	6	..	21	8	17	..	..	..	1	16	..	42	
University of Colorado	2	✓	✓	✓	7	1	3	..	13	3	1	✓	6	✓	2	5	..	17
Yale University	..	1	..	..	..	..	..	..	1	1	12	..	10	..	4	3	..	30
Georgetown University	1	..	..	2	1	1	2	..	7	1	4	..	4	2	10	6	..	27
George Washington University	4	12	..	7	..	7	18	..	48	4	15	..	25	..	9	7	..	60
Howard University	..	..	..	..	..	3	4	..	7	..	..	..	..	..	..	..	..	0
University of Miami	4	2	..	5	..	✓	✓	..	11	..	..	..	..	..	..	..	..	0
University of Florida	..	..	..	..	..	..	..	..	0	1	3	..	1	..	..	2	..	7
Emory University	3	3	..	✓	..	2	✓	..	8	1	4	..	✓	..	3	1	..	9
Medical College of Georgia	✓	✓	..	✓	✓	✓	✓	..	0	..	..	..	..	..	..	..	..	0
Chicago Medical School	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
Northwestern University	2	10	..	3	6	5	1	..	27	1	7	..	3	3	5	3	..	22
Stritch School of Medicine	5	9	..	5	..	2	5	..	26	6	7	..	2	..	5	6	..	26
University of Chicago	2	8	8	14	2	..	8	..	42	9	22	8	12	1	8	8	..	68
University of Illinois	8	10	..	7	2	6	11	..	44	3	13	..	2	✓	5	4	..	27
Indiana University	2	..	..	✓	..	..	1	..	3	3	..	..	1	..	..	✓	..	4
State University of Iowa	3	12	..	4	..	5	7	..	31	6	4	..	5	..	2	17	..	34
University of Kansas	8	2	..	9	..	1	4	..	24	6	5	..	1	..	1	3	..	16
University of Louisville	8	8	..	6	1	..	1	..	24	1	4	..	1	..	1	1	..	8
Louisiana State University	✓	3	..	✓	✓	..	1	..	4	✓	1	..	2	..	..	1	..	4
Tulane University	✓	4	..	5	..	3	✓	1	13	1	10	..	12	..	2	2	..	27
Johns Hopkins University	..	..	..	..	..	..	..	..	0	✓	2	✓	1	✓	✓	✓	✓	3
University of Maryland	..	..	..	..	..	..	..	..	0	4	6	..	3	..	2	..	..	15
Boston University	✓	3	..	5	✓	1	5	..	16	✓	6	..	2	✓	3	3	..	14
Harvard Medical School	..	1	..	..	..	..	..	..	1	✓	23	✓	11	1	1	3	..	39
Tufts University	..	..	..	..	..	..	..	..	0	..	8	..	..	..	4	3	..	15
University of Michigan	4	5	19	19	✓	2	5	..	54	7	12	20	20	✓	19	1	..	79
Wayne State University	✓	7	..	1	1	1	..	..	10	1	10	..	3	✓	3	..	..	17
University of Minnesota	12	18	6	36	24	13	15	..	124	..	✓	..	✓	..	..	..	..	0
University of Mississippi	✓	1	..	✓	2	1	3	..	7	✓	✓	..	1	..	1	1	..	3
University of Missouri	1	6	✓	7	..	..	4	..	18	✓	✓	✓	2	..	..	3	..	5
Saint Louis University	3	1	..	1	✓	✓	✓	..	5	1	20	..	1	..	..	..	..	22
Washington University	1	..	..	..	2	..	..	..	3	1	2	..	4	..	2	1	..	10
Creighton University	1	1	..	9	..	..	2	..	13	..	..	..	..	..	..	..	..	0
University of Nebraska	1	1	..	✓	✓	✓	2	..	4	1	1	..	✓	✓	✓	1	..	3
Dartmouth Medical School	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
Seton Hall College of Medicine and Dentistry	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
Albany Medical College	✓	2	..	✓	1	✓	✓	..	3	✓	8	..	2	✓	1	✓	..	11
University of Buffalo	..	✓	✓	4	..	3	✓	..	7	1	6	..	3	..	✓	6	..	16
Albert Einstein College of Medicine	..	..	..	..	..	..	..	..	0	2	5	..	✓	✓	4	1	..	12
Columbia University	..	..	..	..	..	..	..	..	0	10	14	..	4	..	2	5	..	35
Cornell University	1	✓	2	✓	✓	✓	✓	✓	3	✓	8	3	1	✓	✓	✓	6	18
New York Medical College	✓	✓	✓	✓	✓	✓	✓	✓	0	✓	✓	✓	✓	✓	✓	✓	✓	0
New York University	1	2	..	..	1	..	..	..	4	2	6	..	..	3	✓	..	..	11
State University of New York, Downstate Medical Center, New York City	1	..	..	..	..	..	1	..	2	3	3	..	✓	..	6	3	..	15
University of Rochester	✓	3	32	4	✓	3	1	..	43	2	12	15	5	2	5	7	..	48
State University of New York, Upstate Medical Center, Syracuse	✓	✓	..	1	..	✓	1	..	2	✓	3	..	1	..	3	3	..	10
University of North Carolina	✓	2	..	9	3	..	1	..	15	✓	3	..	4	..	..	3	..	10
Duke University	6	..	..	..	..	..	2	..	8	4	18	..	2	..	2	3	..	29
Bowman Gray School of Medicine	1	✓	..	2	..	1	2	..	6	..	..	..	..	..	..	..	..	0
University of North Dakota	2	1	..	2	✓	✓	2	..	7	..	2	..	..	..	..	..	..	2
University of Cincinnati	✓	✓	..	..	✓	✓	✓	..	0	4	2	..	✓	✓	1	3	..	10
Western Reserve University	..	✓	..	..	..	..	..	..	0	4	15	..	7	3	2	13	..	44
Ohio State University	17	3	..	..	4	..	12	..	36	8	6	..	..	3	..	15	..	32
University of Oklahoma	1	3	..	4	1	1	3	..	13	2	7	..	6	2	2	2	..	21
University of Oregon	5	7	..	1	✓	6	6	..	25	✓	✓	..	✓	✓	✓	✓	..	0
Hahnemann Medical College	4	1	..	3	✓	2	1	..	11	✓	2	..	1	✓	1	✓	..	4
Jefferson Medical College	..	..	..	1	..	5	4	..	10	..	1	..	3	..	6	6	..	16
Temple University	✓	1	..	2	..	..	2	..	5	✓	✓	..	✓	..	✓	✓	..	0
University of Pennsylvania	✓	1	✓	9	✓	✓	4	..	14	6	18	4	41	2	2	15	..	88
Woman's Medical College of Pennsylvania	✓	✓	..	✓	✓	✓	✓	..	0	✓	✓	..	✓	✓	✓	✓	..	0
University of Pittsburgh	..	12	..	2	✓	5	..	..	19	1	5	..	3	✓	1	..	..	10
University of Puerto Rico	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0

*and Enrollments in the Basic Medical Sciences**

Degrees Awarded, 1957-1958

Postdoctorates									Masters†								Doctorates								
Anatomy	Biochemistry	Biophysics	Microbiology	Pathology	Pharmacology	Physiology	Other	Total	Anatomy	Biochemistry	Biophysics	Microbiology	Pathology	Pharmacology	Physiology	Other	Total	Anatomy	Biochemistry	Biophysics	Microbiology	Pathology	Pharmacology	Physiology	Other	Total
..	..	..	..	..	..	..	..	0	..	..	..	1	..	1	1	..	5	..	..	..	..	..	1	..	..	1
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	1
..	..	..	..	..	..	..	..	0	..	3	..	1	..	..	1	..	7	1	..	..	..	..	..	..	..	1
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	3	..	..	..	..	..	..	..	3
✓	✓	..	✓	✓	1	✓	..	1	..	1	..	2	..	..	..	..	3	..	7	..	1	..	1	..	..	9
..	..	..	..	..	..	..	..	0	..	..	..	4	..	..	..	..	4	..	..	..	3	..	..	..	..	3
..	..	..	..	..	1	..	..	1	..	1	..	..	..	1	2	..	4	2	3	..	..	..	1	1	..	7
..	..	..	..	..	..	..	..	0	..	1	..	..	2	1	..	..	4	..	1	..	4	..	..	1	..	6
..	2	..	6	8	6	3	..	25	..	1	..	..	..	..	..	..	1	..	2	..	2	..	..	..	..	4
..	..	..	..	..	..	..	..	0	..	..	..	2	..	..	1	..	3	..	1	..	..	1	..	3	..	5
..	..	..	..	..	..	..	..	0	1	8	..	7	..	2	5	..	23	..	3	..	6	..	2	3	..	14
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	0
2	2	..	2	..	..	1	..	8	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
1	1	..	1	..	2	1	..	6	1	..	..	..	..	..	1	..	2	..	2	..	1	..	..	..	..	3
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	1	..	..	..	1	1	3	..	6	..	1	..	..	1	..	1	..	3
..	..	..	..	..	..	..	..	0	3	2	..	2	..	..	1	..	8	..	..	..	1	..	2	1	..	4
..	..	..	..	..	..	..	..	0	..	..	..	1	2	..	4	..	7	4	3	..	1	..	5	2	..	15
✓	✓	..	✓	✓	✓	✓	..	0	1	4	..	1	..	3	4	..	13	..	1	..	1	1	2	3	..	8
..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	1	1	..	..	1	..	..	..	..	2
1	2	..	..	..	3	3	..	9	..	1	..	3	..	2	3	..	9	2	4	..	5	..	2	6	..	19
..	..	..	..	..	..	..	..	0	..	..	..	2	..	..	..	..	2	1	..	..	..	..	..	1	..	2
..	✓	..	..	..	..	3	..	3	1	2	..	1	..	..	..	..	4	..	..	..	..	..	1	..	..	1
..	..	..	..	..	..	1	..	1	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	✓	0	..	1	..	5	..	..	..	..	6	..	..	..	3	..	..	..	..	5
✓	✓	✓	✓	✓	✓	✓	✓	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	1
✓	✓	✓	✓	✓	✓	✓	..	0	..	3	..	2	..	..	..	..	5	..	2	..	2	..	3	2	..	9
..	..	..	..	..	..	..	..	0	..	1	..	..	..	..	..	..	1	..	7	2	..	..	1	1	..	11
..	2	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	0	..	..	..	..	..	2	1	..	3
..	..	..	..	..	..	..	..	0	2	2	..	6	..	..	2	..	12	4	..	..	1	..	2	..	..	7
1	2	..	✓	✓	✓	..	..	3	..	..	..	..	..	..	..	..	0	..	1	..	..	..	1	..	..	2
..	..	..	..	..	..	..	..	0	1	1	1	3	2	1	5	..	14	..	1	..	4	..	..	..	..	5
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
✓	✓	✓	✓	✓	..	✓	..	0	..	..	..	1	..	..	4	..	5	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	1	2	..	..	..	..	..	..	3	1	..	..	..	..	..	..	..	1
..	3	..	6	1	6	2	..	18	1	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	1
..	..	..	..	1	..	..	..	1	..	1	..	5	..	..	1	..	7	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	1	..	..	..	..	1	..	2	1	..	..	..	..	..	..	..	1
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	..	1	..	..	..	..	..	1	..	3	..	..	..	..	1	..	4
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	4	..	2	..	..	..	..	6
..	..	..	..	..	..	..	..	0	..	..	1	..	..	..	..	..	1	..	..	..	1	..	..	..	0	1
✓	✓	✓	✓	✓	✓	✓	✓	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	2	..	..	..	..	..	..	2	..	1	..	..	..	..	..	..	1
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
..	..	..	3	..	..	..	..	3	..	1	18	1	..	1	2	..	23	..	3	1	1	1	2	3	..	11
..	..	..	..	..	..	..	..	0	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	0
✓	2	..	1	..	✓	..	..	3	..	..	..	2	..	..	..	..	2	..	1	..	1	..	..	..	..	2
..	5	..	1	..	1	..	..	7	1	..	..	..	..	..	..	..	1	2	4	..	1	..	..	..	..	7
..	..	..	..	..	..	..	..	0	..	..	..	1	..	..	1	..	2	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	1	2	..	1	..	..	2	..	6	..	1	..	..	..	..	..	..	1
✓	✓	..	..	✓	1	✓	..	1	..	..	..	..	..	..	..	..	0	..	1	..	..	..	..	1	..	2
..	6	..	4	6	2	3	..	21	..	1	..	..	..	..	..	..	1	1	3	..	2	..	..	..	..	6
..	2	..	..	3	..	..	..	5	7	1	..	..	..	3	5	..	16	1	1	..	..	..	4	..	..	6
..	..	.	..	..	..	..	..	0	..	1	..	1	1	..	1	..	4	..	1	..	3	3	..	..	..	7
..	..	..	..	..	..	..	..	0	2	4	..	..	..	..	1	..	7	..	2	..	..	..	..	..	..	2
..	..	..	..	..	..	..	..	0	2	..	..	..	..	..	1	..	3	..	1	..	1	..	1	..	..	3
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	1	..	1
..	..	..	..	✓	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	2	..	1	..	3
3	✓	22	..	4	✓	✓	✓	29	..	1	..	6	2	..	1	..	10	..	2	1	12	..	1	2	..	18
..	..	..	..	✓	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0

TABLE 18.—*Advanced Degree and Postdoctoral Programs*

	Programs and Enrollment																	
	Masters									Doctorates								
	Anatomy	Biochemistry	Biophysics	Microbiology	Pathology	Pharmacology	Physiology	Other	Total	Anatomy	Biochemistry	Biophysics	Microbiology	Pathology	Pharmacology	Physiology	Other	Total
Medical College of South Carolina	2	√	..	√	..	5	1	..	8	4	√	..	√	..	√	1	..	5
State University of South Dakota	..	3	..	3	..	..	1	..	7	..	..	..	..	..	1	..	..	1
University of Tennessee	√	7	..	2	2	2	3	..	16	3	5	..	1	2	4	12	..	27
Meharry Medical College	..	√	..	√	..	..	√	..	0	..	..	..	..	..	..	..	..	0
Vanderbilt University	√	1	..	√	√	1	√	..	2	√	5	..	1	√	2	1	..	9
Southwestern Medical School	1	1	..	3	..	..	..	..	5	.	1	..	2	..	..	..	..	3
University of Texas, Medical Branch	4	1	..	2	√	√	2	..	9	2	√	..	1	..	2	4	..	9
Baylor University	10	10	..	2	..	1	7	..	30	3	7	..	6	..	..	1	..	17
University of Utah	3	√	..	7	..	√	..	..	10	6	12	..	12	..	5	..	..	35
University of Vermont	..	1	..	..	..	2	1	..	4	..	√	..	..	..	..	..	..	0
University of Virginia	1	2	..	1	..	..	1	..	5	..	2	..	1	..	..	..	..	3
Medical College of Virginia	3	3	..	√	√	..	1	..	7	1	..	1	..	√	3	1	..	6
University of Washington	2	1	..	13	..	2	2*	..	20	1	18	..	12	..	6	18	..	55
West Virgina University	..	2	..	4	..	1	..	..	7	..	..	..	..	..	..	..	..	0
University of Wisconsin	4	..	..	4	..	11	1	..	20	2	8	..	5	..	12	6	..	33
Marquette University	7	1	..	3	8	√	10	..	29	1	1	..	√	√	√	2	..	4
Totals	165	239	67	247	70	127	203	1	1,119	159	457	57	279	24	174	260	6	1,416
Canada																		
University of Alberta	√	4	√	1	√	√	1	..	6	..	√	..	..	..	..	..	..	0
University of British Columbia	1	7	..	..	..	1	2	..	11	√	2	..	..	..	1	√	..	3
University of Manitoba	..	4	..	..	2	3	3	..	12	..	1	..	..	..	..	..	..	1
Dalhousie University	..	2	..	2	..	..	..	..	4	..	1	..	2	..	3	..	..	6
Queen's University	..	3	..	2	1	1	3	..	10	..	1	..	1	..	..	1	..	3
University of Ottawa	1	1	..	..	√	..	√	..	2	1	1	..	..	..	..	..	..	2
University of Western Ontario	1	5	..	..	1	..	1	..	8	..	3	3	3	1	..	2	..	12
University of Toronto	..	3	..	3	..	2	5	..	13	2	10	..	..	..	3	8	..	23
McGill University	1	4	..	3	√	1	6	..	15	3	35	..	4	4	√	4	..	50
University of Montreal	..	2	..	2	..	..	1	..	5	..	1	..	2	..	..	..	..	3
Laval University	√	1	√	1	√	√	√	..	2	√	2	√	1	√	√	√	..	3
University of Saskatchewan	..	1	..	√	2	..	..	..	3	1	1	..	..	1*	..	1	..	4
Totals	4	37	..	14	6	8	22	0	91	7	58	3	13	6	7	16	0	110

* Check (√) indicates an authorized program in which no students were enrolled during the year reported.

† An unknown number of these may be for doctoral degrees, since level of work was not specified.

ever more pertinent. It is to be remembered that general university departments in the biological fields offer graduate programs which serve as another source of teachers and investigators for medical school departments of basic sciences. Data in regard to such general university graduate programs are not available for reporting here. The study of the National Academy of Sciences–National Research Council described elsewhere will bring further understanding of present resources and future potentials for career teachers and investigators in medicine.

In table 18 are presented data for each school showing by basic science discipline the numbers of students enrolled who are working toward the masters or doctoral degree and postdoctoral students who are doing advanced study after having acquired a doctoral degree. Where checks (√) appear in the table, the programs indicated are offered, but no students were enrolled during the year concerned. Table 18 also presents by school and by discipline the number of advanced degrees awarded in the basic medical sciences during the academic year 1957-1958.

Though not striking, there has been an increase in the total number of students working toward doctoral degrees in the basic sciences (table 19). Such a trend is not evident in enrollment figures for programs leading to the masters degree.

At the masters degree level, the largest number of enrollments occurred in microbiology, followed by biochemistry and physiology. At the doctoral level the largest enrollment was in biochemistry, followed by microbiology and physiology. The greatest number of both masters and doctoral degrees awarded was in microbiology, with biochemistry and physiology following in order.

TABLE 19.—*Enrollment in United States Graduate Programs in Basic Medical Sciences, 1955-1958*

	1955-1956	1956-1957	1957-1958
Masters	1,119	939	1,118
Doctoral	1,368	1,304	1,416
Postdoctoral	...*	192	219

* Data not collected for 1955-1956.

Information concerning graduate programs offered, students enrolled and graduate degrees awarded in the basic medical sciences by Canadian

and Enrollments in the Basic Medical Sciences—Continued*

Degrees Awarded, 1957-1958																																	
Postdoctorates										Masters†										Doctorates													
Anatomy	Biochemistry	Biophysics	Microbiology	Pathology	Pharmacology	Physiology	Other	Total	Anatomy	Biochemistry	Biophysics	Microbiology	Pathology	Pharmacology	Physiology	Other	Total	Anatomy	Biochemistry	Biophysics	Microbiology	Pathology	Pharmacology	Physiology	Other	Total
..	..	..	..	..	..	..	..	0	..	..	..	..	..	1	1	..	2	1	..	..	..	..	..	..	..	1
..	..	..	..	..	..	..	..	0	..	..	..	1	..	..	1	..	2	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	1	1	..	..	1	..	1	..	4	..	..	2	..	..	..	..	1	3
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
2	2	..	✓	✓	1	3	..	10	..	1	..	1	..	..	..	..	2	..	1	..	..	..	..	..	..	1
..	..	..	..	..	..	..	..	0	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	1	..	..	..	..	1	2	..	4
..	..	..	..	..	..	..	..	0	2	1	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..	0
..	9	..	..	..	4	2	..	15	?	1	..	1	..	..	..	..	4	1	1	..	5	..	..	..	..	7
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	1	..	..	1
..	9	..	..	..	..	16	..	25	..	1	..	3	..	..	1	..	5	..	2	..	5	..	1	1	..	9
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
✓	3	17	2	..	✓	..	..	22	2	..	..	3	..	..	1	..	6	2	..	4	5	..	2	1	..	14
..	..	..	..	..	..	..	..	0	1	..	..	1	1	..	2	..	5	..	..	..	..	..	..	..	..	0
11	52	39	36	23	28	40	0	219	36	61	21	75	15	16	58	0	282	30	75	8	77	9	38	45	0	282
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	2	..	2	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	8	..	..	..	1	2	..	9	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	1	..	..	..	..	2	..	3	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	1	..	1	..	..	..	..	2	..	..	..	..	..	..	..	..	0
..	..	..	..	..	..	..	..	0	..	2	..	..	..	1	1	..	4	..	..	..	..	..	..	..	..	0
1	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	2	1	..	..	..	..	..	..	..	1
..	..	..	..	..	..	..	..	0	..	1	..	..	..	..	..	..	1	..	4	2	2	..	..	1	..	9
..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	3	..	3	..	..	..	..	..	4	2	..	6
..	..	..	..	..	..	..	..	0	..	6	..	1	..	1	2	..	10	1	13	..	3	..	2	..	..	19
..	..	..	..	..	..	..	..	0	..	1	..	1	..	..	..	..	2	..	..	..	..	..	..	..	..	0
✓	1	✓	✓	✓	✓	✓	..	1	..	..	..	..	..	..	..	..	0	..	..	..	..	..	..	..	..	0
1	..	..	2	..	..	1	..	4	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	1
2	1	0	2	0	0	1	0	6	0	18	0	3	1	3	13	0	38	3	17	2	5	0	6	3	0	36

schools are presented as part of table 18. Since this information was not available for previous years, it is not possible to draw comparisons.

TEACHING RESPONSIBILITIES FOR OTHER THAN MEDICAL STUDENTS

All of the medical schools in the United States, except one of the newly developing schools, have teaching responsibilities for students in addition to those in the basic medical educational program. In the case of eight schools, the additional teaching responsibilities include only interns and residents and in the case of three, include only practicing physicians in continuation education. The remaining 76 schools have responsibility for students in dentistry; nursing; pharmacy; x-ray and medical technology; arts and sciences courses; and such other students as those in physical therapy, occupational therapy, medical records, and medical librarianship in addition to medical students in the basic four year program, medical graduates in internships and residencies in the teaching hospitals of the schools, and physicians in continuing or postgraduate medical education programs.

Table 20 presents by school and student classification the educational responsibilities reported by the medical schools in the United States and Canada for students other than medical students in the basic program. Omitted from the table is a column portraying the number of enrollments by physicians in postgraduate courses inasmuch as the numbers reported did not appear to have a comparable base and thus did not seem to present an accurate picture of that educational responsibility.

The additional teaching responsibilities of the medical schools continue to increase each year. For the United States, such other students totaled at least 44,100, plus at least 20,500 physician enrollments in continuation courses. This represents a total of more than twice the number of medical students in the basic four year program. As has been pointed out previously, the totals given for other than medical students probably represent less than minimum real figures of the additional teaching responsibilities. For instance, a number of schools reporting zero nursing or arts and sciences students added that medical school faculty

teach students in schools of nursing, social welfare, public health, as well as participate in the arts and sciences college programs. Only those interns in the one or two hospitals most closely related to each medical school are included, although some faculty time must be spent with interns and residents in other hospitals affiliated with the medical schools.

A major additional teaching responsibility, that of physicians in postgraduate educational programs, is omitted from the table because the figures did not seem, on the basis of other information the Council has, to have a comparable base among the schools. It will be recalled that in the Fifty-seventh Annual Report [80] a year ago, the analysis of 1,054 postgraduate courses in the 1956-1957 year showed

TABLE 20.—*Teaching Responsibilities for*

	Medical Schools in The United States	Undergraduates or Basic Professional, No. Enrolled						Professional, No. Enrolled (Not Candidates for Advanced Degree)	
		Dental Students	Pharmacy Students	Nurses	Technical Students	Arts and Science Majors	Other	Candidates for Advanced Degrees, No. Enrolled	Interns	Residents
1	Medical College of Alabama	185	0	159	60	0	17	28	36	110
2	University of Arkansas School of Medicine	0	0	0	15	0	22	30	15	56
3	College of Medical Evangelists	196	0	147	17	0	25	15	87	157
4	University of California School of Medicine, Los Angeles	0	0	0	12	0	13	57	25	110
5	University of Southern California School of Medicine, Los Angeles	0	80	0	0	80	0	64	152	300
6	Stanford University School of Medicine	0	0	95	22	46	14	29	43	131
7	University of California School of Medicine, San Francisco	287	275	191	55	0	37	64	43	256
8	University of Colorado School of Medicine	0	0	100	12	31	10	30	48	178
9	Yale University School of Medicine	0	0	42	0	6	27	56	52	106
10	Georgetown University School of Medicine	359	0	191	0	0	38	34	10	130
11	George Washington University School of Medicine	0	45	0	0	164	0	108	23	49
12	Howard University College of Medicine	225	108	33	16	5	7	7	12	61
13	University of Florida College of Medicine	0	0	0	0	2	0	15	0	0
14	University of Miami School of Medicine	0	0	213	17	0	0	11	65	108
15	Emory University School of Medicine	303	0	109	24	0	9	23	53	132
16	Medical College of Georgia	0	0	0	1	0	0	0	3	90
17	Chicago Medical School	0	0	0	0	0	0	0	10	12
18	Northwestern University Medical School	0	0	250	38	0	0	49	31	226
19	Stritch School of Medicine of Loyola University	5	0	0	0	0	0	52	6	37
20	University of Chicago, The School of Medicine	0	0	0	0	0	0	130	42	172
21	University of Illinois College of Medicine	170	193	22	0	0	26	71	36	127
22	Indiana University School of Medicine	137	0	287	57	863	0	7	39	124
23	State University of Iowa College of Medicine	132	99	146	32	264	35	74	20	160
24	University of Kansas School of Medicine	0	0	149	70	0	0	40	22	122
25	University of Louisville School of Medicine	167	0	71	15	27	16	35	29	123
26	Louisiana State University School of Medicine	0	0	23	0	0	8	9	52	140
27	Tulane University of Louisiana School of Medicine	0	0	306	16	0	131	40	52	128
28	Johns Hopkins University School of Medicine	0	0	0	0	0	0	3	144	85
29	University of Maryland School of Medicine and College of Physicians and Surgeons	0	55	50	0	0	8	15	50	133
30	Boston University School of Medicine	0	0	60	8	118	0	30	0	0
31	Harvard Medical School	56	0	0	0	0	0	40	95	540
32	Tufts University School of Medicine	300	0	0	0	0	0	17	40	112
33	University of Michigan Medical School	342	114	615	76	52	133	133	51	323
34	Wayne State University College of Medicine	0	0	0	25	0	0	30	66	131
35	University of Minnesota Medical School	285	51	93	432	304	266	124	38	170
36	University of Mississippi School of Medicine	0	0	44	0	0	15	10	23	43
37	University of Missouri School of Medicine	0	0	187	0	551	508	23	0	23
38	Saint Louis University School of Medicine	131	0	229	98	0	0	27	19	55
39	Washington University School of Medicine	0	0	0	91	0	0	31	184	52
40	Creighton University School of Medicine	90	28	107	0	0	0	14	10	18
41	University of Nebraska College of Medicine	0	0	111	20	0	0	7	7	29
42	Dartmouth Medical School	0	0	143	25	6	11	0	16	56
43	Seton Hall College of Medicine and Dentistry	81	0	0	0	0	0	0	0	0
44	Albany Medical College of Union University	0	0	185	21	0	15	14	64	90
45	University of Buffalo School of Medicine	130	112	140	30	12	0	23	43	125
46	Columbia University College of Physicians and Surgeons	76	0	371	0	0	200	35	27	204
47	Cornell University Medical College	0	0	69	23	0	0	21	73	197
48	Albert Einstein College of Medicine of Yeshiva University	0	0	0	0	0	0	12	52	145
49	New York Medical College, Flower and Fifth Avenue Hospitals	0	0	172	0	0	0	0	0	125
50	New York University College of Medicine	0	0	0	0	0	0	15	64	412

total physician enrollments of 34,913. Since 58.9% of the courses and 58.1% of the course hours occurred in medical schools or their teaching hospitals, there were probably at least 20,500 physician enrollments in these courses for a total of 31,094 course hours. Considering that medical school faculty personnel are involved in teaching in a majority of all postgraduate courses including those outside the medical school itself, this teaching responsibility is an important one not portrayed in the table 20 for the 1957-1958 year.

Other than Medical Students, 1957-1958

		Undergraduates or Basic Professional, No. Enrolled						Professional, No. Enrolled (Not Candidates for Advanced Degree)	
		Dental Students	Pharmacy Students	Nurses	Technical Students	Arts and Science Majors	Other	Candidates for Advanced Degrees, No. Enrolled	Interns	Residents
51	State University of New York Downstate Medical Center, New York City	0	0	0	0	0	0	17	216	351
52	University of Rochester School of Medicine and Dentistry	0	0	292	31	122	14	94	53	117
53	State University of New York Upstate Medical Center, Syracuse	0	0	84	0	0	0	12	29	111
54	University of North Carolina School of Medicine	186	124	124	35	2	0	28	30	89
55	Duke University School of Medicine	0	0	292	10	0	23	44	57	161
56	Bowman Gray School of Medicine of Wake Forest College	0	0	184	22	0	39	6	12	69
57	University of North Dakota School of Medicine	0	0	152	59	66	0	9	0	0
58	University of Cincinnati College of Medicine	0	0	0	0	0	0	11	52	135
59	Western Reserve University School of Medicine	189	0	200	18	0	0	65	58	220
60	Ohio State University College of Medicine	380	51	274	168	135	1,053	73	42	181
61	University of Oklahoma School of Medicine	0	0	151	18	0	0	34	19	77
62	University of Oregon Medical School	0	0	200	24	0	16	25	28	79
63	Hahnemann Medical College and Hospital of Philadelphia	0	0	82	19	0	0	15	9	58
64	Jefferson Medical College of Philadelphia	0	0	267	0	0	0	26	22	95
65	Temple University School of Medicine	0	0	277	26	0	0	5	15	128
66	University of Pennsylvania School of Medicine	139	0	39	133	0	0	131	50	281
67	Woman's Medical College of Pennsylvania	0	0	74	0	0	1	0	13	28
68	University of Pittsburgh School of Medicine	9	0	107	0	0	0	29	12	226
69	University of Puerto Rico School of Medicine	29	0	47	56	0	0	0	24	40
70	Medical College of South Carolina	0	105	189	9	0	0	13	29	63
71	University of South Dakota School of Medicine	0	0	21	3	111	0	8	0	0
72	University of Tennessee College of Medicine	149	176	30	42	0	8	43	48	87
73	Meharry Medical College	117	0	99	10	0	0	0	14	28
74	Vanderbilt University School of Medicine	0	0	0	0	0	0	21	33	74
75	University of Texas Southwestern Medical School	0	0	84	0	0	0	8	32	96
76	University of Texas Medical Branch	0	0	358	53	0	0	18	36	159
77	Baylor University College of Medicine	0	0	27	0	0	0	47	46	193
78	University of Utah School of Medicine	0	38	60	12	170	0	60	29	68
79	University of Vermont College of Medicine	0	0	54	23	0	0	4	20	38
80	University of Virginia School of Medicine	0	0	332	4	0	0	8	34	88
81	Medical College of Virginia	271	269	103	139	0	14	13	55	105
82	University of Washington School of Medicine	253	109	474	150	994	98	100	41	109
83	West Virginia University School of Medicine	30	59	0	13	0	0	7	0	0
84	University of Wisconsin Medical School	0	170	101	327	0	0	94	16	85
85	Marquette University School of Medicine	224	0	0	220	0	0	33	36	125
	Totals	5,583	2,201	10,252	2,952	4,131	2,808	2,773	3,223	10,127
	Medical Schools in Canada									
1	University of Alberta Faculty of Medicine	109	80	36	70	122	30	6	19	39
2	University of British Columbia School of Medicine	0	40	170	32	50	34	14	52	80
3	University of Manitoba Faculty of Medicine	0	0	400	0	0	0	13	50	40
4	Dalhousie University Faculty of Medicine	37	43	54	0	30	16	10	56	52
5	Queen's University Faculty of Medicine	0	0	20	0	5	12	13	13	14
6	University of Ottawa Faculty of Medicine	0	0	0	0	0	0	5	39	12
7	University of Western Ontario Faculty of Medicine	0	0	111	0	0	0	20	0	0
8	University of Toronto Faculty of Medicine	155	173	32	70	76	366	36	144	0
9	McGill University Faculty of Medicine	142	0	100	0	275	117	65	75	311
10	University of Montreal Faculty of Medicine	87	122	0	65	0	159	8	110	0
11	Laval University Faculty of Medicine	0	0	300	41	4,700	0	6	121	0
12	University of Saskatchewan College of Medicine	0	69	143	25	13	41	11	12	45
	Totals	530	527	1,366	303	5,271	775	207	691	593

If one assumes that the schools were at least as active in courses for practicing physicians in 1957-1958 as was ascertained in the previous year, four categories of other than medical students account for more than two-thirds of the additional educa-

tional responsibility in United States schools in 1957-1958. These were physician enrollments in postgraduate continuation courses (at least 20,500), student nurses (10,252), residents (10,127), and arts and science majors (4,131). It should be pointed out that the numbers in the first and last categories just mentioned represent enrollments rather than individuals.

Relative to their total number of medical students in the basic four-year programs, the 12 Canadian medical schools had a proportionately larger educational responsibility for other students than did United States schools. In Canada, the other than medical students totalled 10,263, not counting the 413 students in premedical college work for whom three medical faculties (Queen's, Ottawa, and Toronto) had responsibility. The other students comprise almost three times the 3,685 medical students, not including physicians in continuation courses for which information was not comparable. The single group comprising about one-half of the other students were arts and science majors (5,271), while student nurses made up the next largest category (1,366).

The large numbers of other students for whom medical schools have educational responsibilities in addition to those imposed by medical students have significant implications on the personnel, budget, and facility needs of the schools. Unless these needs take into account the total teaching, research, and service responsibilities of each school, the educational value of any or all of the programs may be impaired.

SUPPLY OF ANATOMIC MATERIAL

The questionnaire this year to the medical schools included specific inquiry about the adequacy of supply of cadavers. In reply, although 72 schools indicated that the supply was adequate for the teaching needs of first year medical students, 13 of the 72 schools expressed reservations regarding the total adequacy of their anatomic material. Seven schools stated that the supply was barely or minimally adequate, one suggesting poor quality of material. Four schools stated that the quantity was satisfactory for first-year students but that it was inadequate for teaching surgical anatomy, seniors, and postgraduate courses. Two schools noted that the limited amount of anatomic material available increased the number of students per cadaver more than was desired, i. e., five or six students per cadaver as compared to the desired four, or four students per cadaver in a school where a 2:1 ratio is preferred.

Of the 13 schools in nine states and territories reporting an inadequate supply of cadavers, 5 commented that the state and county welfare agencies are providing burial to an increasing extent for the indigent who have ever received public assistance in any amount, thus decreasing the supply of anatomic material from the unclaimed and indigent deceased.

Requests or will-contracts disposing of the body to the medical school were mentioned by 11 schools, 5 of them being in California and the others in Florida, Ohio, Pennsylvania, Texas, and Wisconsin. Six of the schools cited bequests of bodies as providing an increasing supply of cadavers. One school in California relies entirely on the willed body program. Another school in that state expects to be able to do likewise in two years. A third school, which requires 50 cadavers a year and which would need 1,500 will-contracts to meet that need, received new will-contracts in 1957-1958 at the rate of 10 each week.

Considering the trend toward diminution in supply of cadavers from the unclaimed indigent population as well as the unprecedented response by the public in meeting the need by bequest in those states having statutes enabling such will-contracts, it is to be hoped that additional states will act to give legal recognition of bequests of bodies to medical schools.

Another factor among the schools which reported without reservation an adequate supply of anatomic material was the establishment and maintenance of understanding of the needs of the school as well as good relationships with morticians, social welfare agencies, and other public officials concerned with the disposal of unclaimed bodies. The development of such insights and helpful interpersonal relationships appears to be an important approach for better assuring an adequate supply of anatomic material. A medical school in one state having a potentially effective supply through law, but a lack of implementation by public officials, undertook to communicate to those officials the importance to the public of securing cadavers in order that the medical school could continue to meet its responsibilities in the education of medical students, physicians, and the advancement of medical science. That school reported that the cadaver supply, which had been relatively inadequate until 1954-1955, improved substantially to such an extent that a two-year supply was on hand in 1957-1958.

With few exceptions, those schools in states having a state anatomic board or committee established to provide cadavers to medical and dental schools report no lack of anatomic material.

In Canada, 10 schools reported an adequate supply of anatomic material, though 4 of those schools expressed reservations. One stated the supply was barely adequate and another school reported that it was adequate "only recently." A third Canadian medical school reported a shortage of female cadavers. A fourth, which prefers four students to one cadaver, stated that the available sup-

ply permits only a 5:1 ratio. Neither of the two schools reporting an inadequate supply proffered an explanation. Only one Canadian school, the University of British Columbia, cited bequeathed bodies as a source of anatomic material.

SUPPLY OF ANIMAL MATERIAL

A sufficient supply of healthy animals of various kinds is important not only to the educational activities of a modern medical school but to its research as well. Specific inquiry of the medical schools was made for 1957-1958 regarding the availability of living animals. The responses present problems that should concern the practicing profession, medical educators, and all others interested in the humane treatment of dogs.

Three schools in the United States did not reply regarding the adequacy of animal material. Of the 82 schools replying, 12 stated that the supply was frankly inadequate, while 69 schools reported with reservations that the supply was adequate in 1957-1958. The reservations included "adequate for teaching but not for research," "barely adequate for present needs," high cost, unpredictable delivery with seasonal shortages or inadequacy on specific demand. Nine schools of the 69 reporting an "adequate but" supply had one or more of these reservations.

The 12 schools reporting a frankly inadequate supply, chiefly of dogs, commented that the activities of antivivisectionist groups and their control of humane societies and local dog pounds were a major cause of the difficulty. This necessitated purchase of dogs from distant vendors, resulting in the delivery of ill kept dogs that were initially costly as well as expensive in terms of restoring the animals to health and in the limitation of research requiring healthy animals. It would seem that if the humane societies were really primarily interested in the welfare of dogs, they would not adopt attitudes and policies that make it necessary for medical schools to secure dogs from distant sources. The shipping of animals who are initially ill kept certainly must contribute further to their misery. If humane societies are concerned with the comfort of dogs, cutting off a local supply of healthy, though unclaimed, animals can only result in their shipment without adequate provision for proper feeding and care by the dealers who secure them. On the other hand, medical schools must be concerned with the health, comfort, and feeding of their animals because the results of tests are meaningless when the animals used are ill at the outset or are subject to pain.

All 12 of the Canadian medical schools reported an adequate supply of animals in 1957-1958, although one school commented about the "prohibitive" cost.

MEDICAL STUDENTS

ENROLLMENTS

For the ninth consecutive year, the number of students enrolled in approved and newly developing medical schools in the United States has established a new record high. Complete enrollment data for the individual schools is shown in table 12. Comparative data for this and preceding years are presented in table 21. In order to provide a true picture of medical education in the United States, table 21 and subsequent tables, unless otherwise noted, contain additions in the appropriate columns of the students in the newly developing schools: the University of Florida College of Medicine,

TABLE 21.—*Schools, Students, and Graduates in the Medical and Basic Sciences Schools in the United States, 1931-1958*

	Schools	1st Year	2nd Year	3rd Year	4th Year	Total	Graduates
1930-1931	76	6,456	5,538	5,080	4,808	21,882	4,735
1931-1932	76	6,390	5,462	4,982	4,885	22,135	4,906
1932-1933	77	6,428	5,479	5,017	4,948	22,466	4,805
1933-1934	77	6,457	5,571	4,988	4,937	22,799	5,035
1934-1935	77	6,356	5,642	5,142	4,985	22,888	5,101
1935-1936	77	6,606	5,458	5,220	5,070	22,564	5,181
1936-1937	77	5,910	5,269	5,140	5,158	22,095	5,377
1937-1938	77	5,791	5,225	4,986	5,036	21,587	5,194
1938-1939	77	5,764	5,160	4,947	4,921	21,302	5,089
1939-1940	77	5,794	5,177	4,921	4,804	21,271	5,097
1940-1941	77	5,837	5,254	4,969	4,849	21,379	5,275
1941-1942	77	6,218	5,406	5,087	4,942	22,031	5,161
1942-1943	76	6,425	5,808	5,278	5,160	22,631	5,223
1943-1944	77	6,561	6,071	5,640	5,257	23,529	5,134
1944 (2nd Session)	77	6,048	6,140	6,084	5,794	24,066	5,169
1944-1945	77	6,523	5,979	5,700	5,826	24,028	5,136
1945-1946	77	6,060	5,750	5,751	5,655	23,216	5,826
1946-1947	77	6,564	5,575	5,767	5,994	23,900	6,380
1947-1948	77	6,487	5,758	5,154	5,340	22,739	5,543
1948-1949	78	6,688	6,194	5,702	5,086	23,670	5,694
1949-1950	79	7,042	6,344	6,079	5,628	25,163	5,553
1950-1951	79	7,177	6,620	6,263	6,056	26,186	6,135
1951-1952	79	7,436	6,864	6,577	6,195	27,076	6,680
1952-1953	79	7,425	7,003	6,725	6,475	27,668	6,668
1953-1954	80	7,449	7,068	6,983	6,727	28,227	6,861
1954-1955	81	7,576	7,104	6,957	6,946	28,583	6,977
1955-1956	82	7,696	7,174	6,960	6,886	28,639	6,845
1956-1957	85*	8,014	7,259	7,023	6,834	29,130	6,796
1957-1958	85†	8,060	7,504	7,051	6,888	29,473	6,861

* Includes schools in development.
† Includes schools provisionally approved.

Seton Hall College of Medicine and Dentistry, and Albert Einstein College of Medicine of Yeshiva University.

As was also the case in the previous three years, the figures in table 12 for enrollments by class as well as the total enrollments include the special and part-time students. The numbers of these students are tabulated for each school in the column after the total enrollment, although they are distributed in the enrollment figures in the prior columns of the table. A later section of this report categorizes for the first time the kinds of activities of part-time and special students.

The median total enrollment in 1957-1958 was 321, compared with 330 last year and 335 in the 1955-1956 year. The average total enrollment was

TABLE 22.—*Number of Applicants and Completed Applications by School for Class First Entering 1957-1958**

	Size of Freshman Class	No. of Applications			Total Applications Filed by Applicants to Each School	Av. No. of Applications per Applicant
		Men	Women	Total		
Medical College of Alabama	81	276	21	297	1,453	4.9
University of Arkansas School of Medicine	96	177	3	180	274	1.5
College of Medical Evangelists	112	168	16	184	411	2.2
University of California School of Medicine, Los Angeles	49	542	43	585	3,957	6.8
University of Southern California School of Medicine, Los Angeles	67	610	37	647	4,847	7.5
Stanford University School of Medicine	62	479	34	513	3,903	7.7
University of California School of Medicine, San Francisco	70	384	27	411	2,837	6.9
University of Colorado School of Medicine	85	196	16	212	598	2.8
Yale University School of Medicine	79	917	76	993	8,679	8.7
Georgetown University School of Medicine	108	985	51	1,036	9,634	9.3
George Washington University School of Medicine	101	1,313	57	1,370	12,741	9.3
Howard University College of Medicine	103	495	39	534	2,835	5.3
University of Florida College of Medicine	51	307	12	319	2,134	6.7
University of Miami School of Medicine	70	215	13	228	1,002	4.4
Emory University School of Medicine	74	650	22	672	4,427	6.6
Medical College of Georgia	103	202	11	213	503	2.2
Chicago Medical School	73	1,059	31	1,090	11,358	10.7
Northwestern University Medical School	130	1,380	59	1,439	11,226	7.8
Stritch School of Medicine of Loyola University	88	797	33	830	5,814	7.0
University of Chicago, The School of Medicine	72	1,048	63	1,111	9,767	8.7
University of Illinois College of Medicine	100	511	38	549	2,422	4.4
Indiana University School of Medicine	138	477	28	505	2,189	4.3
State University of Iowa College of Medicine	120	198	5	203	429	2.1
University of Kansas School of Medicine	102	348	12	360	1,918	5.3
University of Louisville School of Medicine	103	230	12	242	909	3.7
Louisiana State University School of Medicine	125	282	16	298	811	2.7
Tulane University of Louisiana School of Medicine	144	1,013	36	1,049	7,467	7.1
Johns Hopkins University School of Medicine	74	870	80	950	8,522	8.9
University of Maryland School of Medicine and College of Physicians and Surgeons	95	327	10	337	2,584	7.7
Boston University School of Medicine	74	1,119	92	1,211	11,835	9.8
Harvard Medical School	114	1,199	87	1,277	9,588	7.5
Tufts University School of Medicine	114	795	45	840	7,391	8.8
University of Michigan Medical School	206	617	34	651	2,925	4.5
Wayne State University College of Medicine	75	386	22	408	1,437	3.5
University of Minnesota Medical School	133	336	21	357	1,286	3.6
University of Mississippi School of Medicine	80	180	9	189	521	2.8
University of Missouri School of Medicine	75	184	6	190	570	3.0
Saint Louis University School of Medicine	121	1,226	43	1,269	10,114	8.0
Washington University School of Medicine	96	1,476	61	1,537	12,381	8.1
Creighton University School of Medicine	77	765	22	787	6,303	7.9
University of Nebraska College of Medicine	87	228	11	239	776	3.2
Dartmouth Medical School	24	318	2	320	3,091	9.7
Seton Hall College of Medicine and Dentistry	80	998	44	1,042	9,957	9.6
Albany Medical College of Union University	63	1,040	40	1,106	11,586	10.5
University of Buffalo School of Medicine	84	769	32	801	8,096	10.1
Columbia University College of Physicians and Surgeons	120	1,528	151	1,679	14,272	8.5
Cornell University Medical College	84	1,209	116	1,325	11,751	8.9
Albert Einstein College of Medicine of Yeshiva University	98	1,086	53	1,139	11,883	10.4
New York Medical College, Flower and Fifth Avenue Hospitals	178	1,689	102	1,791	16,870	9.4
New York University College of Medicine	134	1,241	93	1,334	13,455	10.1
State University of New York Downstate Medical Center, New York City	153	1,229	91	1,320	12,960	9.8
University of Rochester School of Medicine and Dentistry	71	1,043	56	1,119	11,024	9.8
State University of New York Upstate Medical Center, Syracuse	86	1,051	42	1,093	10,810	9.9
University of North Carolina School of Medicine	69	267	17	284	1,443	5.1
Duke University School of Medicine	79	819	46	865	7,083	8.2
Bowman Gray School of Medicine of Wake Forest College	54	772	40	812	6,643	8.2
University of North Dakota School of Medicine	40	96	4	100	368	3.7
University of Cincinnati College of Medicine	93	1,024	27	1,051	8,410	8.0
Western Reserve University School of Medicine	82	1,286	86	1,372	10,472	7.6
Ohio State University College of Medicine	150	539	28	567	2,326	4.1
University of Oklahoma School of Medicine	80	240	12	252	942	3.6
University of Oregon Medical School	79	462	18	480	3,006	6.3
Hahnemann Medical College and Hospital of Philadelphia	108	1,107	44	1,151	9,289	8.1
Jefferson Medical College of Philadelphia	178	1,748	1	1,749	12,889	7.4
Temple University School of Medicine	136	1,451	83	1,534	12,139	7.9
University of Pennsylvania School of Medicine	128	1,545	79	1,624	13,669	8.4
Woman's Medical College of Pennsylvania	51	0	199	199	1,307	6.6
University of Pittsburgh School of Medicine	102	531	26	557	4,419	7.9
University of Puerto Rico School of Medicine	53	98	25	123	352	2.9
Medical College of South Carolina	80	194	9	203	386	1.9
University of South Dakota School of Medicine	40	247	16	263	1,982	7.5
University of Tennessee College of Medicine	270	537	18	555	1,451	2.6
Meharry Medical College	73	417	30	447	2,010	4.5
Vanderbilt University School of Medicine	53	736	28	764	6,766	8.9
University of Texas Southwestern Medical School	104	474	30	504	1,485	2.9
University of Texas Medical Branch	132	519	37	556	1,588	2.9
Baylor University College of Medicine	86	913	30	943	6,830	7.2
University of Utah School of Medicine	58	295	11	306	1,765	5.8
University of Vermont College of Medicine	51	551	22	573	2,942	7.8
University of Virginia School of Medicine	77	649	44	693	5,575	8.0
Medical College of Virginia	85	338	25	363	1,854	5.1
University of Washington School of Medicine	75	442	19	471	2,833	6.0
West Virginia University School of Medicine	46	127	9	136	458	3.4
University of Wisconsin Medical School	90	182	12	194	662	3.4
Marquette University School of Medicine	105	997	37	1,034	7,318	7.1
	8,030	57,052	3,294	60,946†	.....	3.9‡

* Reference 31.

† Total number of applications filed by all applicants to all medical schools.

‡ Total number of individuals applying for entrance to Fall 1958 class was 15,791. Average applications per applicant were 3.9.

347, compared with 366 last year and 370 in the 1955-1956 year. The trend to smaller total classes noted last year appears to be supported by the current median and average. However, the students in the entirely newly developing schools more than compensate so that the number of total students is greater than ever.

Four schools each had a total enrollment of more than 600 (Tennessee, Michigan, Jefferson, and Illinois). Last year a fifth school, the University of Texas at Galveston, with an enrollment of 601, was also included in this group.

As was the case last year also, the University of Michigan and the University of Tennessee medical schools admitted more than 200 students into their entering classes in 1957-1958 (206 and 220 respectively). There were this year five additional schools with first-year enrollments of 150 or more students, though six schools were so categorized last year.

The total entering class was the largest yet enrolled (8,030), as tables 12 and 21 portray. However, there was not the large increase in 1957-1958 that occurred in 1956-1957 when the entering classes of the newly developing University of Florida and Seton Hall medical schools were included for the first time. Six schools had major changes in entering class size compared to the previous year; four increased and two decreased. The increases included Howard (33.3%), West Virginia (29%), College of Medical Evangelists (16.3%), and Miami (11.2%). The University of Texas at Galveston and Western Reserve University medical schools' first year classes decreased by 19.5% and 9.9% respectively. The median entering class numbered 86 students as compared with 84 in 1956-1957. The average first-year class in the four year schools was 97.2 compared with 94 in the previous year and 97 in 1955-1956.

TABLE 23.—*Number of Applicants to Medical Schools, 1948-1958**

Year	Individual Applicants, No.
1948-1949	24,242
1949-1950	24,434
1950-1951	22,279
1951-1952	19,920
1952-1953	16,763
1953-1954	14,678
1954-1955	14,538
1955-1956	14,887
1956-1957	15,918
1957-1958	15,791

* Reference 31.

Table 22, prepared by the Association of American Medical Colleges [31] lists by schools the number of applicants and applications to each of the schools for the 1957-1958 entering class. It should be noted that, although the numbers of men and women listed as applying to each school are individual applicants for each school, the over-all totals for the schools enumerate applications and not applicants. There were a total of 60,946 applications to all medical schools filed by 15,791 applicants, or an average of 3.9 schools applied to by each prospective medical student. For a complete and detailed study of applicants, applications, and acceptances for this class, the GEE study [31] should be consulted.

TABLE 24.—*Schools, Students, and Graduates in the Medical and Basic Science Schools in Canada, 1948-1958*

	Schools	1st Year	2nd Year	3rd Year	4th Year	Total	Graduates
1948-1949	10	887	765	842	739	3,233	679
1949-1950	10	897	798	761	822	3,278	791
1950-1951	11	990	880	844	865	3,489	858
1951-1952	11	873	891	858	836	3,458	783
1952-1953	11	918	869	805	852	3,444	825
1953-1954	12	982	901	844	916	3,643	806
1954-1955	12	968	903	881	837	3,589	891
1955-1956	12	1035	883	877	856	3,651	816
1956-1957*	12	1001	934	855	865	3,655	891
1957-1958	12	1012	916	928	830	3,686	828

*The remaining school of the basic medical sciences (Saskatchewan) became a four-year school with students in all years.

Although the number of applicants decreased a trifle in 1957-1958 compared to the preceding year, there was no significant change. The ratio of applicants (15,791) to places in the entering class (8,030) remained 1.9:1 as it was in the previous year. Table 23 presents the number of individual applicants to United States medical schools each year for the past 10 years.

The Canadian medical schools, as shown in table 13, also had in 1957-1958 a larger enrollment than previously of medical students, if the students in only the basic four-year program are counted each year to give comparable figures, excluding those in the premedical or required intern years. Comparative data for this and preceding years are presented in table 24. The median enrollment in 1957-1958 was 228 and the average 307, as compared with 224 and 304 in the previous year. Data on the applicants and applications to Canadian schools were not available for the 1957-1958 academic year in time for publication.

In 1957-1958, 82 United States citizens were enrolled in the first medical year in Canadian schools as compared with 4 Canadians enrolled in the first-year classes of United States medical schools. This is 10 fewer United States citizens in Canadian first-year medical classes than was the case in the 1956-1957 year. Even so, the favorable net balance of 78 United States citizens in the first medical year of Canadian schools represents the equivalent of another United States school having a class size larger than that of 28 of the United States medical schools.

ENROLLMENT OF WOMEN STUDENTS

Information by school on the number of men and women enrolled and graduated in the United States is shown in table 25. Woman's Medical

College enrolled only women, while Dartmouth and Jefferson continued to limit their enrollments to men. In 1957-1958, the 1,644 women enrolled comprised 5.57% of all enrollments, as compared to 1646 or 5.65% in 1956-1957. The proportion decreased slightly due chiefly to a larger total enrollment figure as only two fewer women were enrolled. The total women graduates increased, as predicted last year, by 25, comprising 5.1% of all graduates compared with 4.8% in the 1956-1957 class.

Excluding Woman's Medical College, the medical schools of four universities (University of Illinois, State University of New York in Brooklyn, Columbia University, and New York University), one more than in the previous year, each enrolled more than 40 women. Six other medical schools each enrolled more than 30 women: Howard, Harvard, Michigan, Western Reserve, Temple, and Tennessee. In five medical schools, women accounted for 10% or more of the enrollment: Howard, Boston University, New York University, Western Reserve, Puerto Rico. Women comprised 10% or more of the graduating class in four schools: Howard, Boston University, Wayne State, and Western Reserve.

The enrollments and graduates by sex in Canadian medical schools are also depicted in table 25. In 1957-1958, 259 women comprised 7.02% of the total enrollment, an increase of 23 or 917% over the 1956-1957 year. All 12 schools had women enrolled, although Queen's University had no women

TABLE 25.—*Distribution of Students and Graduates in the United States and Canada by Sex, 1957-1958*

	Students		Graduates	
United States	Men	Women	Men	Women
Medical College of Alabama	266	23	63	5
University of Arkansas	330	15	79	6
College of Medical Evangelists	367	17	91	5
University of California, Los Angeles	186	9	47	0
University of Southern California	253	11	57	3
Stanford University	222	12	50	4
University of California, San Francisco	298	26	80	3
University of Colorado	294	24	75	4
Yale University	289	20	67	5
Georgetown University	302	15	97	3
George Washington University	361	22	86	4
Howard University	287	38	59	8
University of Miami	250	15	59	1
University of Florida	88	4	0	0
Emory University	272	6	65	1
Medical College of Georgia	372	14	92	1
Chicago Medical School	274	1	65	0
Northwestern University	497	22	128	3
Stritch School of Medicine	326	11	72	1
University of Chicago	265	23	67	3
University of Illinois	633	44	140	10
Indiana University	365	18	135	3
State University of Iowa	421	13	101	3
University of Kansas	306	16	103	4
University of Louisville	306	16	90	5
Louisiana State University	415	19	90	5
Tulane University	486	17	123	5
Johns Hopkins University	272	21	70	5
University of Maryland	344	11	77	1
Boston University	263	28	64	7
Harvard Medical School	482	30	125	10
Tufts University	409	21	104	5
University of Michigan	717	33	162	7
Wayne State University	267	15	65	7
University of Minnesota	468	21	107	6
University of Mississippi	245	8	42	2
University of Missouri	302	4	31	1
Saint Louis University	455	12	116	1
Washington University	332	12	84	3
Creighton University	276	7	63	1
University of Nebraska	315	12	82	1
Dartmouth Medical School	48	0	0	0
Seton Hall College of Medicine and Dentistry	148	9	0	0
Albany Medical College	221	8	58	2
University of Buffalo	250	14	75	3
Albert Einstein College of Medicine	230	15	0	0
Columbia University	428	42	106	9
Cornell University	314	20	77	4
New York Medical College	470	27	111	4
New York University	465	54	114	11
State University of New York, Downstate Medical Center, New York City	539	50	133	12
University of Rochester	276	7	71	2
State University of New York, Upstate Medical Center, Syracuse	286	14	69	2
University of North Carolina	250	7	55	3
Duke University	301	14	77	4
Bowman-Gray School of Medicine	190	14	48	1
University of North Dakota	76	2	0	0
University of Cincinnati	324	19	74	2
Western Reserve University	294	31	70	7
Ohio State University	554	18	137	2
University of Oklahoma	355	17	81	2
University of Oregon	276	16	66	4
Hahnemann Medical College	377	17	92	4
Jefferson Medical College	682	0	158	0
Temple University	443	34	112	6
University of Pennsylvania	490	19	118	8
Woman's Medical College of Pennsylvania	0	185	0	45
University of Pittsburgh	349	16	76	4
University of Puerto Rico	162	26	41	4
Medical College of South Carolina	294	11	73	2
State University of South Dakota	77	3	0	0
University of Tennessee	738	50	169	13
Meharry Medical College	245	22	55	2
Vanderbilt University	190	7	46	0
University of Texas, Southwestern	367	21	85	5
University of Texas, Galveston	545	28	143	8
Baylor University	309	12	75	3
University of Utah	205	2	48	0
University of Vermont	165	14	36	2
University of Virginia	276	14	63	3
Medical College of Virginia	334	23	93	4
West Virginia University	272	16	0	0
University of Washington	67	3	68	4
University of Wisconsin	298	22	70	6
Marquette University	373	30	90	6
Totals	27,829	1,644	6,566	355
Canada				
University of Alberta	204	10	45	2
University of British Columbia	195	19	44	3
University of Manitoba	214	12	43	2
Dalhousie University	210	13	53	3
Queen's University	200	14	45	0
University of Ottawa	219	18	55	2
University of Western Ontario	216	13	55	2
University of Toronto	526	53	106	13
McGill University	406	28	106	2
University of Montreal	406	35	111	2
Laval University	501	28	113	7
University of Saskatchewan	121	16	32	6
Totals	3,427	259	808	44

graduates. The number of women medical students enrolled in Canadian schools has increased each year for the past four years, although it has not yet approximated the 276 women enrolled (7.5%) in 1953-1954.

Women graduates in 1957-1958 numbered 44, or 5.16% of the total graduates, a decrease of 20 as compared with 1956-1957, and the smallest number absolutely and proportionately since the 1951-1952 year when there were 36 women or 4.6% of the graduates.

Four Canadian schools (Toronto, McGill, Montreal, Laval) each enrolled 25 or more women. An additional three schools (British Columbia, Ottawa, and Saskatchewan) each enrolled 15 or more women. Two schools, the University of Toronto and the University of Saskatchewan, each enrolled women as 10% or more of their classes.

GEOGRAPHICAL SOURCE OF ENTERING STUDENTS

The residence of students at the time of their enrollment in the medical schools in the United States are shown in table 26, based on enrollment data for 1957-1958 from the medical schools.

This table indicates that 41% of all first-year medical students came from six states (New York, Pennsylvania, California, Ohio, Illinois, and Texas), as has been true for the past two years. The first-year enrollment of the 32 schools in these states also represented 41% of the total enrollment for the nation. Almost 38% of all medical schools in the United States are located in the same six states.

There were fewer than 20 first-year medical students from each of five states (Nevada, Delaware, Wyoming, Maine, and New Mexico) and fewer than 30 students from each of five other states (New Hampshire, Idaho, Montana, Vermont, and Rhode Island). Of these 10 states, only New Hampshire and Vermont have medical schools. The 74 students from the five states supplying the fewest medical students and the 123 students from the five other states represented only 2.4% of the total first-year class, 10 students and 0.17% larger than in the 1956-1957 academic year.

Table 27 lists the states in ascending order according to the number of enrolled first-year medical students per 100,000 population. The six states with the largest number of first-year students are distributed throughout this list, with one-half having less than the median number of students per 100,000 population (4.5) and one-half having more than the median number. As was true last year also, with the exception of Vermont and Wyoming, the other eight states having the smallest number of first-year students enrolled in medical schools had fewer students than the median number.

The over-all ratio of students per 100,000 population, excluding members of the armed forces, is unchanged from the 4.7 of last year.

There were seven schools, all state-owned, that enrolled as first-year medical students only those resident in the state in which the school is located. This appears to be a marked improvement as compared to 12 such schools in the 1956-1957 year, until the data in table 28 is noted. This table presents nonresident enrollments by numbers of schools in various proportion categories as well as numbers of students involved in the publicly-owned schools, as compared with four years ago when a similar analysis was developed. It will be seen that there is no significant change in the number of schools restricting their nonresident enrollment to less than 10% of the class, or in the number of nonresident students enrolled by the publicly-owned schools. Not counting the seven schools enrolling no nonresident students, the median proportion of the entering classes consisting of nonresidents was 8.1% in the publicly-owned schools and 50.9% in the privately-owned schools. The respective averages were 10.4% and 53%. The 57th annual report on Medical Education in the United States and Canada [32] presented a summary of geographical restrictive policies of the medical schools based on statements to the Association of American Medical Colleges that year.

As table 29 shows, a total of 37 entering students in United States schools came from the territories and possessions of Canal Zone, Hawaii, and Puerto Rico, and one came from Alaska. The 38 students entered 24 medical schools. Hawaii with 20 students and Puerto Rico with 16 students contributed nearly all of the 38 students. Of these areas, only Puerto Rico has a medical school.

Table 30 presents the geographic source of first-year medical students in the Canadian medical schools in 1957-1958. It should be noted at the outset that 82 students came from the United States (while only 4 students from Canada entered United States schools), representing a balance favorable to the United States of 78 students, as compared to a favorable balance of 84 students in 1956-1957, as was pointed out in the section on enrollments. The 82 United States students were distributed among 11 of the 12 Canadian schools. As in previous years, the majority of United States citizens (51 in 1957-1958 compared to 47 in 1956-1957) enrolled in McGill University. The four United States schools each enrolling one Canadian student in 1957-1958 were the College of Medical Evangelists, the University of Chicago, Johns Hopkins University, and the University of Kansas.

With the exception of the University of Alberta Faculty of Medicine, all other Canadian medical schools enrolled in the first medical year students not resident in the province in which the school was located. The proportion of such students varies from 2.5% to 64.7% in the 11 schools enrolling such

TABLE 26.—*Geographical Source of Entering Students*

	School	1 Alabama	2 Arizona	3 Arkansas	4 California	5 Colorado	6 Connecticut	7 Delaware	8 District of Columbia	9 Florida	10 Georgia	11 Idaho	12 Illinois	13 Indiana	14 Iowa	15 Kansas	16 Kentucky	17 Louisiana	18 Maine
1	Medical College of Alabama	71	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..
2	University of Arkansas School of Medicine	..	..	93	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	College of Medical Evangelists	..	..	..	76	..	..	..	1	2	..	..	1	..	3	..	..	..	..
4	University of California School of Medicine, Los Angeles	..	..	..	47	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	University of Southern California School of Medicine	..	..	..	61	..	..	..	..	..	..	..	..	..	..	..	..	1	..
6	Stanford University School of Medicine	..	2	..	36	..	1	..	..	..	..	1	..	..	1	1	..	..	..
7	University of California School of Medicine, San Francisco	..	..	..	77	..	..	..	..	..	..	1	..	..	..	..	..	..	..
8	University of Colorado School of Medicine	..	2	..	..	70	..	..	..	..	..	..	..	..	..	..	..	1	..
9	Yale University School of Medicine	..	1	..	5	1	12	..	..	1	..	..	1	2	..	..	..	..	1
10	Georgetown University School of Medicine	..	1	..	..	2	6	1	14	..	1	..	1	..	..	..	1	..	1
11	George Washington University School of Medicine	..	2	..	11	..	2	..	11	1	..	3	2	1	..	..	..	..	..
12	Howard University College of Medicine	1	..	1	6	..	3	..	11	2	2	..	1	..	1	..	1	..	..
13	University of Florida College of Medicine	..	..	..	..	..	2	..	..	43	..	..	2	..	..	..	..	..	..
14	University of Miami School of Medicine	..	..	..	1	..	..	..	..	73	1	..	..	..	..	..	..	..	..
15	Emory University School of Medicine	2	..	..	..	..	..	1	13	11	..	..	1	..	..	..	2	..	..
16	Medical College of Georgia	..	..	..	..	..	..	..	..	102	..	..	1	..	..	..	..	..	..
17	Chicago Medical School	..	..	..	3	..	1	..	1	..	..	..	6	..	..	..	..	..	..
18	Northwestern University Medical School	..	1	..	18	1	..	..	..	1	..	3	16	4	3	3	..	..	..
19	Stritch School of Medicine of Loyola University	1	..	..	2	..	..	..	..	..	..	..	44	7	1	2	..	..	..
20	University of Chicago, The School of Medicine	..	..	..	8	..	..	..	..	..	..	..	32	3	1	..	..	..	..
21	University of Illinois College of Medicine	..	1	..	..	..	..	..	..	..	..	..	188	..	..	..	..	..	..
22	Indiana University School of Medicine	1	..	..	..	..	..	..	..	..	..	..	2	146	..	..	..	..	1
23	State University of Iowa College of Medicine	..	..	..	..	..	..	..	..	..	..	..	1	..	113	..	..	..	..
24	University of Kansas School of Medicine	..	..	..	..	..	..	..	..	..	..	..	1	..	..	91	..	..	..
25	University of Louisville School of Medicine	..	..	..	1	..	1	..	..	..	..	..	1	3	..	..	90	..	..
26	Louisiana State University School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	123	..
27	Tulane University of Louisiana School of Medicine	11	5	5	3	1	..	..	..	11	2	..	..	..	..	2	..	18	..
28	Johns Hopkins University School of Medicine	..	3	1	3	1	2	..	..	2	2	..	6	1	..	..	1	..	..
29	University of Maryland School of Medicine	..	..	..	2	..	1	..	1	..	..	..	..	1	..	..	..	..	..
30	Boston University School of Medicine	..	..	..	3	..	5	..	..	..	..	..	1	..	1	..	..	..	..
31	Harvard Medical School	1	..	1	1	..	3	..	..	2	..	..	3	2	3	1	..	1	3
32	Tufts University School of Medicine	..	..	..	1	..	10	..	..	1	..	..	..	..	..	..	..	..	2
33	University of Michigan Medical School	..	..	..	2	1	..	1	..	..	..	..	5	..	..	..	..	..	..
34	Wayne State University College of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
35	University of Minnesota Medical School	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
36	University of Mississippi School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
37	University of Missouri School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
38	Saint Louis University School of Medicine	1	2	1	17	1	4	..	..	1	..	1	10	1	1	6	2	1	..
39	Washington University School of Medicine	2	1	..	7	1	..	..	..	2	..	2	11	3	2	1	1	..	..
40	Creighton University School of Medicine	..	..	..	13	..	1	..	..	..	..	3	1	..	10	2	..	..	..
41	University of Nebraska College of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..
42	Dartmouth Medical School	..	..	..	2	..	1	..	..	..	..	..	..	..	..	..	..	..	..
43	Seton Hall College of Medicine and Dentistry	..	..	..	..	..	3	..	..	..	..	..	..	..	1	..	..	..	..
44	Albany Medical College of Union University	1	..	..	2	..	2	..	..	..	..	..	..	..	..	1	..	..	..
45	University of Buffalo School of Medicine	..	..	..	3	..	..	..	..	..	..	..	4	..	..	..	..	..	..
46	Columbia University College of Physicians and Surgeons	..	2	..	2	..	3	..	1	1	1	..	1	1	..	..	..	..	3
47	Cornell University Medical College	..	..	..	3	2	..	2	..	1	..	..	5	..	1	..	..	..	1
48	Albert Einstein College of Medicine of Yeshiva University	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..
49	New York Medical College, Flower and Fifth Avenue Hospitals	..	..	..	..	..	8	..	1	1	..	..	1	..	..	..	..	..	..
50	New York University College of Medicine	..	..	..	2	..	4	..	1	..	..	..	2	..	..	..	..	..	..
51	State University of New York Downstate Medical Center, New York City	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
52	University of Rochester School of Medicine and Dentistry	..	..	..	1	..	2	1	1	..	..	..	2	..	..	..	..	..	..
53	State University of New York Upstate Medical Center, Syracuse	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
54	University of North Carolina School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
55	Duke University School of Medicine	1	..	..	2	1	1	..	1	8	5	..	..	..	..	..	1	..	..
56	Bowman Gray School of Medicine of Wake Forest College	1	..	..	..	..	..	..	1	1	2	..	..	..	..	..	1	..	..
57	University of North Dakota School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
58	University of Cincinnati College of Medicine	..	1	..	3	..	..	1	1	..	..	..	4	..	..	..	2	..	..
59	Western Reserve University School of Medicine	1	1	..	..	..	..	..	1	1	..	..	1	3	..	..	..	..	..
60	Ohio State University College of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
61	University of Oklahoma School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..
62	University of Oregon Medical School	..	..	..	..	..	..	..	..	..	..	..	4	..	..	..	..	..	..
63	Hahnemann Medical College and Hospital of Philadelphia	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..
64	Jefferson Medical College of Philadelphia	1	..	..	2	..	..	5	3	..	..	..	..	..	..	..	..	..	..
65	Temple University School of Medicine	..	..	..	1	..	2	..	..	..	..	..	2	..	..	..	..	..	..
66	University of Pennsylvania School of Medicine	1	..	..	5	..	3	1	1	1	1	..	3	..	..	..	..	..	1
67	Woman's Medical College of Pennsylvania	..	..	..	6	..	1	..	..	1	2	..	1	..	1	..	..	..	..
68	University of Pittsburgh School of Medicine	..	..	..	2	..	1	..	..	..	..	..	..	..	..	..	..	..	..
69	University of Puerto Rico School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
70	Medical College of South Carolina	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
71	State University of South Dakota School of Medicine	..	..	..	3	1	..	..	..	..	..	..	1	..	5	1	..	..	..
72	University of Tennessee College of Medicine	3	1	4	..	..	..	..	1	2	..	1	..	..	..	..	3	1	..
73	Meharry Medical College	8	..	..	1	..	1	..	1	3	5	..	1	..	..	..	..	3	..
74	Vanderbilt University School of Medicine	3	..	..	..	..	..	..	1	2	4	..	1	..	..	..	8	..	..
75	University of Texas Southwestern Medical School	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
76	University of Texas Medical Branch, Galveston	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
77	Baylor University College of Medicine	1	3	..	2	..	..	..	..	..	..	..	1	..	1	..	..	..	1
78	University of Utah School of Medicine	..	3	..	1	..	1	..	1	..	..	3	..	..	..	..	..	..	..
79	University of Vermont College of Medicine	..	..	..	..	..	4	..	..	..	..	..	..	..	..	..	..	..	1
80	University of Virginia School of Medicine	..	..	..	..	..	2	2	3	2	..	..	..	..	..	..	..	..	..
81	Medical College of Virginia	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	1	1	..
82	University of Washington School of Medicine	..	2	..	1	..	..	..	..	..	..	..	2	..	..	..	..	..	..
83	West Virginia University School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
84	University of Wisconsin Medical School	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
85	Marquette University School of Medicine	..	2	..	2	..	..	..	2	..	..	1	5	2	4	..	..	..	..
	Totals	115	36	106	466	84	102	17	60	183	171	23	404	181	157	113	115	150	16
	Marginal No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

in Medical Schools of the United States, 1957-1958

19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	
Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	U.S. Territories and Possessions	Canada	Foreign	Home State	Out of State	Totals	Marginal Number
..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	1	..	..	1	..	..	..	..	..	..	..	74	7	81	1
1	1	1	..	..	..	..	..	1	..	..	..	..	1	1	1	1	..	1	..	1	..	..	..	..	..	..	3	..	..	1	1	11	..	93	9	98	2
..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	76	36	112	3
..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	47	2	49	4
..	2	..	1	..	..	..	..	..	..	..	..	2	..	1	2	1	..	..	..	..	..	1	2	1	..	..	1	..	1	1	..	4	..	64	3	67	5
..	2	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	36	26	62	6
1	6	1	2	..	..	..	..	..	..	..	12	23	1	..	..	1	..	..	..	..	..	..	1	..	..	..	1	..	..	1	..	..	..	77	2	79	7
1	15	2	..	..	..	..	..	..	..	..	11	30	..	..	..	..	..	1	..	..	..	..	..	..	..	..	2	1	..	..	..	1	..	70	15	85	8
14	3	2	1	1	..	1	3	..	..	..	9	11	1	1	6	1	..	15	3	..	..	..	..	..	..	4	1	1	1	..	1	..	..	90	16	106	11
4	2	2	4	..	..	..	..	..	..	..	5	18	3	..	6	3	1	7	..	1	..	..	..	..	..	3	..	1	..	..	..	9	..	11	92	103	12
..	1	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	43	8	51	13
..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	75	4	79	14
..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	3	1	..	..	..	..	..	..	..	..	1	..	23	2	25	15
..	..	..	..	..	..	..	..	..	..	..	..	39	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	102	1	103	16
..	1	3	2	..	1	3	..	..	..	4	1	6	..	..	11	1	..	..	..	..	1	..	1	3	..	..	..	..	..	..	..	..	..	67	6	73	17
..	2	3	1	..	..	..	..	..	..	1	..	4	..	..	10	..	..	1	..	..	..	..	..	2	..	..	1	1	8	..	1	..	..	46	84	130	18
1	..	1	1	..	..	..	..	1	..	1	..	1	..	..	..	..	..	3	..	..	..	..	..	..	..	..	1	..	1	..	..	1	..	44	44	88	19
..	..	..	..	..	..	..	..	..	..	1	..	1	..	2	1	1	1	..	..	..	..	1	..	..	..	1	..	1	1	1	1	..	..	32	40	72	20
..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	188	2	190	21
..	..	1	..	..	..	..	..	..	..	2	..	2	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	146	12	158	22
..	..	..	..	..	..	..	..	1	..	..	..	2	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	113	7	120	23
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	91	11	102	24
..	..	..	..	..	1	..	..	..	..	3	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	90	13	103	25
..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	123	2	125	26
..	2	..	1	24	4	1	..	..	..	1	1	..	..	..	1	5	..	3	1	..	1	2	17	..	..	..	..	1	1	2	..	7	..	18	116	134	27
6	4	..	..	2	1	..	..	..	..	8	..	..	1	..	3	1	..	1	..	1	..	1	4	..	6	1	..	..	..	..	..	..	..	6	68	74	28
63	..	..	..	..	..	..	..	..	..	1	1	3	3	..	..	..	..	1	..	1	..	..	1	..	1	..	1	1	1	3	..	..	..	61	29	90	29
1	34	1	1	..	..	..	..	..	..	3	..	21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	34	40	74	30
9	11	1	1	..	2	..	..	..	..	8	..	26	..	..	5	3	2	10	4	..	..	1	2	..	..	3	1	1	..	..	..	..	..	14	100	114	31
..	55	..	..	..	..	..	..	..	9	5	..	9	1	..	3	..	..	..	6	..	..	..	..	..	..	..	..	..	..	..	..	1	..	55	59	114	32
..	..	183	..	..	..	..	1	..	..	11	..	1	2	1	4	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	183	23	206	33
..	..	73	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	73	2	75	34
..	..	..	125	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	125	6	131	35
..	..	..	..	79	..	22	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	79	1	80	36
..	..	..	..	..	..	15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	73	0	73	37
2	5	3	..	..	..	15	..	..	1	4	..	4	..	..	22	3	1	6	..	..	..	1	2	..	..	..	4	..	1	..	1	..	..	106	171	98	38
4	1	1	1	17	..	..	..	..	1	1	..	8	1	..	5	..	..	1	..	..	..	1	3	..	..	..	1	..	1	3	..	1	..	17	69	86	39
1	..	1	1	..	1	..	14	..	..	..	..	6	..	..	5	..	1	1	..	2	..	1	1	..	..	..	1	..	1	3	..	1	..	14	63	77	40
..	..	..	3	..	1	..	82	..	2	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	82	5	87	41
..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	1	..	1	2	1	..	..	1	1	..	1	..	..	..	..	..	..	..	..	2	22	24	42
1	..	..	..	..	..	..	..	..	..	1	..	30	..	..	1	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	30	33	63	43
..	4	1	..	..	..	..	..	..	1	6	..	39	1	..	1	1	..	..	1	..	..	..	..	..	2	..	..	..	..	1	..	..	..	39	24	63	44
..	..	..	..	..	..	..	..	..	..	4	..	73	..	..	3	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	73	11	84	45
..	9	1	1	..	..	..	..	1	1	13	..	61	1	..	3	..	..	6	..	..	..	..	3	..	..	..	4	..	..	..	..	1	..	61	59	120	46
1	3	..	..	..	..	..	..	1	..	7	1	40	1	..	3	1	..	3	..	..	..	..	2	2	..	..	..	..	..	1	..	3	..	40	44	84	47
1	15	..	..	..	..	..	..	..	..	2	..	80	..	..	1	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	80	12	92	48
2	5	3	..	..	..	..	..	..	..	16	..	69	..	..	1	..	..	3	3	..	..	..	..	..	..	..	..	..	..	..	..	1	..	69	59	128	49
..	..	..	..	1	..	..	..	..	..	..	..	91	1	..	1	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	94	40	134	50
..	2	..	1	..	..	..	..	..	..	9	..	142	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	142	11	153	51
1	..	..	..	..	..	..	..	..	..	5	..	36	1	..	3	..	..	2	..	..	1	..	1	..	1	..	1	..	1	4	..	2	..	36	35	71	52
..	..	..	..	..	..	..	..	..	..	1	..	80	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	80	6	86	53
..	..	..	..	..	..	..	..	..	..	..	..	..	99	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	99	3	69	54
1	..	..	1	1	..	..	..	..	..	3	..	4	31	..	1	..	..	1	..	5	..	1	1	..	..	9	..	3	..	..	..	..	..	31	48	79	55
..	1	..	..	..	..	..	..	..	..	..	..	2	32	..	4	..	..	..	..	2	..	2	..	..	..	1	..	2	..	..	..	2	..	32	22	54	56
1	..	..	3	..	..	1	..	1	..	..	..	..	..	35	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	33	7	40	57
..	..	5	1	..	..	..	..	..	..	1	..	4	..	69	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	1	..	1	..	69	24	93	58
1	..	..	..	..	..	..	..	..	..	..	..	5	..	51	..	..	..	5	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	51	31	82	59
..	..	..	..	..	..	..	..	..	..	..	..	..	..	150	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	150	0	150	60
..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	97	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	97	3	100	61
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	69	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	69	10	79	62
..	..	..	..	..	..	..	..	..	..	12	..	4	..	..	1	..	85	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	85	23	108	63
1	1	..	..	..	..	..	..	..	..	24	..	3	..	1	4	..	127	1	..	..	..	..	1	..	..	2	..	1	..	..	1	..	..	127	51	178	64
1	..	..	..	..	..	..	..	..	..	10	..	3	..	..	1	..	109	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	109	27	136	65
3	1	..	..	..	..	..	..	..	..	18	..	7	1	..	..	1	81	..	2	..	..	..	1	..	..	..	..	1	..	..	..	..	..	93	47	140	66
..	6	3	1	..	..	..	..	..	..	3	..	7	..	..	3	..	46	..	..	1	..	..	..	..	..	..	..	..	1	1	..	2	..	11	51	62	67
..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	2	..	87	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	87	15	102	68
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	53	..	..	53	9	53	69
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	80	..	..	..	..	..	..	..	..	..	..	..	..	..	80	0	80	70
..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	2	..	..	..	..	..	28	..	182	..	..	..	2	..	..	..	..	1	..	28	18	46	71
..	..	..	4	4	..	..	..	..	..	..	..	4	5	..	5	1	..	3	..	1	..	185	1	..	..	..	..	..	..	..	..	..	..	183	37	220	72
..	1	..	3	1	..	..	..	..	..	1	..	4	2	..	3	1	..	..	..	2	..	8	11	..	..	7	..	1	..	..	..	..	..	8	65	73	73
..	..	..	2	3	..	..	..	..	..	1	..	2	3	..	2	1	..	..	..	..	..	20	..	..	..	..	..	1	..	..	..	..	..	20	33	53	74
..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	1	..	..	..	..	..	..	..	98	..	..	..	..	..	1	..	..	1	..	98	6	104	75
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	182	..	..	..	..	..	..	..	..	..	..	132	0	132	76
..	1	..	1	2	1	..	..	..	..	1	1	1	1	3	5	2	..	..	1	..	..	..	47	..	..	..	..	..	..	1	..	2	..	47	30	77	77
..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	48	..	..	..	..	..	..	..	..	..	48	10	58	78
..	11	..	..	..	..	..	..	..	9	1	..	3	..	..	..	..	..	..	1	..	..	..	..	..	21	..	..	..	..	..	..	..	..	21	30	51	79
2	2	1	..	..	..	..	..	..	..	2	1	5	..	..	1	..	..	2	..	..	..	..	..	..	..	49	..	2	..	..	..	1	..	49	28	77	80
..	2	..	..	..	..	..	..	..	..	1	..	1	1	..	1	..	..	..	..	..	..	..	..	..	..	69	..	3	..	..	..	..	..	69	16	85	81
..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	64	..	..	..	..	2	..	64	11	75	82
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	40	..	..	..	..	..	40	0	40	83
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	89	..	..	..	..	89	1	90	84
..	..	5	6	..	..	1	..	..	..	1	..	8	..	..	8	..	..	..	..	1	..	..	..	..	..	..	3	..	48	..	4	..	..	48	57	105	85
114	215	394	163	124	143	25	102	3	22	316	19	1,066	160	45	418	130	87	587	28	103	30	229	335	63	25	161	92	67	164	17	91	4	73	5,329	2,501	8,030	
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	87

students with only 4 schools taking fewer than 10% nonresident students. Three provincially owned schools each enrolled more than 10% non-residents; two of the schools (University of British Columbia and University of Manitoba) each enrolled more than 20% of the entering class from outside the province of the school.

TABLE 27.—*Ratio of First-year Students to State Populations, 1957-1958*

Number of Students per 100,000 population* in the Approved and Newly Developing Medical and Basic Science Schools of the United States	
Nevada†	1.2
Maine†	1.7
New Mexico†	2.4
Arizona	3.2
California	3.4
Missouri	3.4
Rhode Island†	3.4
West Virginia	3.4
Washington	3.5
Idaho†	3.6
North Carolina	3.6
Alabama	3.7
Texas	3.7
Montana†	3.8
Kentucky	3.8
Michigan	3.9
New Hampshire	3.9
Delaware†	4.0
Indiana	4.0
Maryland	4.0
Illinois	4.2
Wisconsin	4.3
Virginia	4.4
Massachusetts	4.5
South Carolina	4.5
Connecticut	4.6
Florida	4.6
Georgia	4.6
Ohio	4.6
Minnesota	4.9
Oregon	4.9
Louisiana	5.0
Colorado	5.1
South Dakota	5.2
Pennsylvania	5.3
Kansas	5.4
Wyoming†	5.5
Iowa	5.6
Mississippi	5.7
New Jersey	5.7
Oklahoma	5.8
Arkansas	6.1
New York	6.7
Tennessee	6.7
Vermont	6.7
North Dakota	7.0
Nebraska	7.1
District of Columbia	7.4
Utah	7.4
United States	4.7

* Estimated July 1, 1957, total population excluding members of the armed forces stationed in each area. Current Population Reports, series P-25, no. 168, Dec. 9, 1957.
† States with no medical school.

Of the total of 215 out-of-province students enrolled in the 11 Canadian schools, 40 came from the British Commonwealth of Nations and other countries, and 82 came from the United States. Thus, a total of 93 Canadians enrolled in the first medical year class of Canadian schools outside their home province. The provincial schools accounted for 49.4% of these 93 Canadians as compared to the publicly-owned schools in the United States enrolling only 14.1% of the out-of-state United States students.

TABLE 28.—*Out-of-State Enrollments of Entering Class*

	1953-1954			1957-1958		
Percentage of Class Non resident	Number of Schools: Privately Owned	Number of Schools: Publicly Owned	Number of Non-residents Taken into Publicly Owned Schools	Number of Schools: Privately Owned	Number of Schools: Publicly Owned	Number of Non-residents Taken into Publicly Owned Schools
0	0	15	0	0	7	0
<5	0	4 (22)	18 (51)	1	11 (25)	25 (79)
5-10	1	4	33	1	7	54
10-50	19	15	304	20	14	244
50-100	21	1	30	23	1	30
Totals	41	39	385	45	40	354

The Canadian provinces ranking highest as the residence of first-year medical students in 1957-1958 were Quebec and Ontario, accounting for 61.8% of the total class. However, 58.3% of the Canadian medical schools are located in those two provinces. Prince Edward Island, the only province in Canada having no medical school, was the source of the fewest medical students (7) in the entering class, although Nova Scotia was the source

TABLE 29.—*Geographic Source of Entering Students in Medical Schools of the United States from Possessions and Outlying Territories of the United States, 1957-1958*

Schools	Alaska	Canal Zone	Hawaii	Puerto Rico	Total
College of Medical Evangelists	..	..	..	1	1
Yale University School of Medicine	..	..	..	1	1
George Washington University, School of Medicine	..	..	..	1	1
Northwestern University Medical School	..	..	1	..	1
Stritch School of Medicine of Loyola University	..	..	1	..	1
University of Chicago, The School of Medicine	..	..	1	..	1
Tulane University of Louisiana School of Medicine	..	..	1	1	2
University of Maryland School of Medicine	..	..	..	3	3
Boston University School of Medicine	..	..	2	..	2
University of Michigan Medical School	..	..	1	..	1
Saint Louis University School of Medicine	..	..	1	..	1
Washington University School of Medicine	..	..	3	..	3
Creighton University School of Medicine	..	..	2	..	2
Albany Medical College of Union University	..	..	1	..	1
Cornell University Medical College	..	1	..	..	1
Western Reserve University School of Medicine	..	..	..	1	1
University of Oregon Medical School	..	..	1	..	1
Jefferson Medical College of Philadelphia	..	..	..	1	1
Temple University School of Medicine	..	..	..	5	5
Woman's Medical College of Pennsylvania	..	..	1	..	1
Baylor University College of Medicine	..	..	1	..	1
Medical College of Virginia	..	..	..	1	1
University of Washington School of Medicine	1	..	..	..	1
Marquette University School of Medicine	..	..	3	1	4
Totals	1	1	20	16	38

of only 14 students. The Yukon and Northwest Territories, the source of no entering medical students, are sparsely populated frontier areas.

ATTRITION AND GEOGRAPHIC RESIDENCE RESTRICTIONS

The hypothesis was first suggested in the 55th Annual Report [3] that the attrition of students due to poor scholarship was significantly higher in publicly-owned schools than in privately-owned schools, at least in part due to the prevalence of geographic restrictions as to residence of students, which limited the population from which publicly-owned schools drew their first-year medical students. It was then suggested that the data in future years should be examined to provide additional information on this point.

Table 31 presents a comparison of first-year enrollments, applications, and attrition with poor scholarship by type of school ownership from 1954-1955 through 1957-1958. It is apparent that in each year, the publicly-owned schools had only one-fourth to one-fifth of the number of applications as did the privately-owned schools and had only 4% to 9% of their entering students resident outside the state in which the school was located. Although the proportion of the total entering classes enrolled in each was about equal, the number of students lost by poor scholarship was significantly larger each year in the publicly-owned medical schools. The chi-square of the differences in the numbers of students actually failing or withdrawing in poor academic standing in the publicly and privately owned schools as compared to what would be expected solely on the proportion of students enrolled in each is so large for each year as to make it highly unlikely that chance alone can account for these differences. The probabilities of this are given in the bottom lines of table 31.

In a similar table last year, the significance test was inadvertently applied to the proportions of students withdrawing rather than to the numbers of students. In consequence, it did not appear then

TABLE 30.—*Geographic Source of First Year Medical Students in Medical School of Canada, 1957-1958*

	Provinces of Canada											
	Alberta	British Columbia	Manitoba	New Brunswick	Nova Scotia	Ontario	Prince Edward Island	Quebec	Saskatchewan	United States	British Commonwealth and Foreign	Totals
University of Alberta Faculty of Medicine	58	..	..	..	..	..	..	..	..	..	..	58
University of British Columbia School of Medicine	1	48	2	..	..	..	..	1	..	4	5	61
University of Manitoba Faculty of Medicine	2	1	53	..	..	3	..	..	2	2	7	70
Dalhousie University Faculty of Medicine	..	..	..	29	13	..	7	1	..	3	8	61
Queen's University Faculty of Medicine	..	..	..	1	..	53	..	3	..	4	..	61
University of Western Ontario Faculty of Medicine	..	..	..	..	..	60	..	..	..	3	..	63
University of Ottawa Faculty of Medicine	1	..	1	1	1	29	..	27	2	10	..	72
University of Toronto Faculty of Medicine	1	1	..	..	..	151	..	1	..	1	5	160
McGill University Faculty of Medicine	..	..	..	1	..	8	..	41	1	51	14	116
University of Montreal Faculty of Medicine	..	..	..	..	..	1	..	118	..	1	1	121
Laval University Faculty of Medicine	..	..	..	3	..	2	..	127	1	2	..	135
University of Saskatchewan College of Medicine	1	1	..	..	..	..	..	1	30	1	..	34
Totals	64	51	56	35	14	307	7	320	36	82	40	1,012*

TABLE 31.—*First-Year Enrollments, Applications, and Attrition with Poor Scholarship by Type of School Ownership*

	1954-1955		1955-1956		1956-1957		1957-1958	
	Publicly Owned	Privately Owned	Publicly Owned	Privately Owned	Publicly Owned	Privately Owned	Publicly Owned	Privately Owned
Number of schools	39	41	39	43	40*	45*	40*	45*
Percentage of enrollment	50	50	49	51	48	52	48	52
Percentage of enrollment from out of state	9	53	5	31	4	27	4	27
Percentage of applications	26	74	19	81	27	73	27	73
Percentage of failures and withdrawals in poor academic standing	68	32	56	44	60	40	54	46
Number of students failing or withdrawing	176	81	182	142	229	139	244	204
Chi-square of differences in numbers of students actually failing or withdrawing in publicly and privately owned schools as compared to what would be expected solely on proportion of students enrolled	34.37		6.52		29.42		7.52	
p, or probability, of these differences occurring solely by chance (one degree of freedom)	<0.001 (much less than 1 in 1,000)		Between 0.01 to 0.02 (about 1 in 90)		<0.001 (much less than 1 in 1,000)		>0.005 (almost 1 in 200)	

* Includes the three newly developing schools that are provisionally approved.

that the differences were as highly significant each year as they actually are. When the chi-square test is applied to the differences in numbers of students lost by poor scholarship in publicly owned versus privately owned schools, the probability of this happening by chance alone is not more than 1 in 90 and for two of the years is far less than 1 in 1000.

Another way of stating the problem is that their geographical restrictions on residence restrict application by and hence choice of as many highly capable students on the part of publicly-owned medical schools as by the more generally nonrestrictive privately owned schools. According to a study currently in progress by Dr. Helen Gee, of the Association of American Medical Colleges,[24] there is evidence that the Medical College Admissions Test scores are lower on the average for entering students in the publicly owned schools than for entering students in the privately owned schools. That test is taken by practically all applicants to United States medical schools. Such a difference in average scores of the two groups of students supports by different data the thesis suggested by the attrition from poor scholarship. It

TABLE 32.—*Comparative Analysis of College Records of First-Year Medical Students*

College Grade Average, First-year Medical Students		United States								Canada
		1950-1951	1951-1952	1952-1953	1953-1954	1954-1955	1955-1956	1956-1957	1957-1958	1957-1958
3.6-4.0	(A).....	40	30	18.0	21.1	16.8	15.8	16.1	17.7	17.9
2.6-3.5	(B).....	43	55	67.5	68.9	69.0	70.6	69.9	66.0	46.8
1.0-2.5	(C).....	17	15	14.5	10.0	14.2	13.6	14.0	16.3	35.3

should be noted that, as in the case with all averages, the average scores of entering students in some publicly-owned schools are higher than are the average scores in some privately-owned schools. The important factor from both sets of data is not type of ownership but rather the presence or absence of any policy likely to restrict or discourage enough applications from among which the best classes of students can be selected.

The policy of restricting most admissions to students who live in the state where the school is located has been evident for years in many of the publicly owned medical schools. Such a policy is advocated and defended by legislators as insuring educational opportunities for the sons and daughters of the taxpayers of the state, who support those schools.

The very policy and practice of so selecting entering classes that only a small proportion of students come from other states tends to preselect applicants to the disadvantage of the school and of society itself. Intelligence, high motivation, and other attributes desired by society and necessary in medical students are not distributed geographically. Capable students are discouraged from applying to a medical school across state lines if they are unlikely to be accepted because of where they happen to live. In consequence, some 12 privately-owned medical schools without restrictions on place of residence had 14 or more applicants per place in the entering class in 1957-1958 and an additional 7 privately owned schools had 12 to 14 applicants per place. Of the 18 medical schools having 9 to 12 applicants per place, 15 or five-sixths are privately owned. On the other hand, of the 16 medical schools that had only two to three applicants to each place in the entering class, all but one were publicly owned. Two of the three medical schools which had fewer than two applicants per place in 1957-1958 are state universities.

With their choice of an adequate applicant population from which to select limited by restrictions on residence together with pressures to fill their classes, many publicly-owned medical schools accept as students some individuals who are not as capable as might be some others who could have been accepted otherwise. This results in dual tragedy. The more apparent one is the failure of those students. The more important casualties, however, are the school and state itself for not having taken or had the opportunity to enroll the more capable students who did not apply or who were rejected solely because of state of residence. Some of those students may also have been lost to medicine itself.

Parochialism to this degree that is so disadvantageous both to capable individuals and to the broader interests and welfare of society itself should not be tolerated. It is to be hoped that state legislators and other public officials concerned with these matters will cooperate with university and medical school administrators in bringing the policies restricting admissions into a more realistic and socially useful focus.

COLLEGE RECORD OF FIRST-YEAR MEDICAL CLASS

Table 32 presents a comparative analysis of the premedical collegiate scholastic record of the entering classes in medicine in the United States each year since 1950-1951. As has been true since 1951-1952, about two-thirds of the first year medical classes had college grade averages of "B", while about one-fifth to one-sixth had college grade averages of "A" on entering medical school. Since 1954-1955, the proportion of students entering medical school with college grade averages of "A" and of "C" have been approximately equal, together comprising about one-third of the total entering classes.

In 1957-1958, 22 schools had more than the average proportion (17.7%) of "A" students in their entering classes, ranging from 19.6% to 68%. Nine of these were publicly-owned and 13 privately-owned schools. Seven of the 22 schools had entering classes in which students with "A" college records

comprised more than 50% of the class. On the other extreme, 32 schools had more than the average proportion of "C" students (16.3%), ranging from 17.5% to 70.5% of students entering with "C" college records. Nineteen schools reported that one-fourth or more of the students in their entering classes had "C" college grade averages. Two of these are the same schools that also reported a significantly higher than average proportion of "A" students in their entering classes.

Although medical school admissions committees recognize the differences among colleges in the relationship of a given grade average to scholastic achievements, this should be pointed out to others who might consult table 32. For instance, scholastic achievement in one college that is awarded a "B" grade might in another college be given a "C" grade and similarly, though to a lesser degree, in the case of "A" compared to "B" grades. The scholastic record in college is one factor among many that are considered in the selection of medical students by the medical school faculties.

Table 32 also presents the premedical college grade averages of the 1957-1958 Canadian first year medical classes. The proportion of students having "A" college grades was similar to that in the United

TABLE 33.—*Premedical Education of First-Year Students in the United States, 1957-1958*

	Size of First-Year Class	Less than Three Years of College		Four Years of College	Degree	Advanced Degree	with Degrees	%
Medical College of Alabama	81	..	13	68	62	..	76.5	
University of Arkansas	90	..	34	59	44	3	47.8	
College of Medical Evangelists	112	..	..	112	111	..	99.1	
University of California, Los Angeles	49	..	7	42	41	1	83.7	
University of Southern California	67	..	19	48	39	8	58.2	
Stanford University	62	..	16	46	44	2	71.0	
University of California, San Francisco	79	4	32	43	35	1	44.3	
University of Colorado	85	..	23	62	48	2	56.5	
Yale University	79	..	9	70	66	1	83.5	
Georgetown University	108	2	4	102	102	2	94.4	
George Washington University	101	..	35	66	63	..	62.4	
Howard University	103	..	1	102	100	9	97.1	
University of Florida	51	..	1	50	48	2	94.1	
University of Miami	79	..	25	54	42	2	53.2	
Emory University	74	..	15	59	54	2	73.0	
Medical College of Georgia	103	..	19	84	74	3	71.8	
Chicago Medical School	73	..	..	73	72	1	98.6	
Northwestern University	130	..	31	99	98	1	77.5	
Stritch School of Medicine of Loyola University	88	..	26	62	57	2	64.8	
University of Chicago	72	2	5	65	57	4	79.2	
University of Illinois	199	..	94	96	84	5	44.2	
Indiana University	158	..	67	91	66	4	41.8	
State University of Iowa	120	..	72	48	42	5	35.0	
University of Kansas	102	..	..	102	89	1	87.3	
University of Louisville	103	..	7	96	94	4	91.3	
Louisiana State University	125	..	59	66	49	2	39.2	
Tulane University	134	..	61	73	58	1	43.3	
Johns Hopkins University	74	..	..	74	74	2	100.0	
University of Maryland	93	1	8	84	80	9	86.0	
Boston University	74	..	4	70	68	5	91.9	
Harvard Medical School	114	..	2	112	109	1	95.6	
Tufts University	114	..	..	114	112	4	98.2	
University of Michigan	206	1	131	74	69	4	33.5	
Wayne State University	75	..	49	26	25	2	33.3	
University of Minnesota	131	..	47	84	65	4	49.6	
University of Mississippi	80	..	28	52	49	1	50.0	
University of Missouri	75	..	18	57	53	4	70.7	
St. Louis University	121	..	19	102	87	1	71.9	
Washington University	86	..	17	69	67	..	77.9	
Creighton University	77	..	24	53	47	3	61.0	
University of Nebraska	87	..	42	45	29	3	33.3	
Dartmouth Medical School	24	..	15	9	8	1	33.3	
Seton Hall College of Medicine	80	..	3	77	76	5	95.0	
Albany Medical College of Union University	63	1	..	62	61	1	96.8	
University of Buffalo	84	..	14	70	68	6	81.0	
Columbia University	120	..	..	120	120	4	100.0	
Cornell University	84	..	3	81	80	1	95.2	
Albert Einstein College of Medicine of Yeshiva University	98	..	2	96	95	6	96.9	
New York Medical College	128	..	..	128	126	8	98.4	
New York University	134	..	3	131	127	6	94.8	
State University of New York, Downstate Medical Center, New York City	153	..	6	147	145	3	94.8	
University of Rochester	71	..	8	63	59	6	83.1	
State University of New York, Upstate Medical Center, Syracuse	86	..	12	74	71	6	82.6	
University of North Carolina	69	..	13	56	48	4	69.6	
Duke University	79	..	18	61	54	..	68.4	
Bowman Gray School of Medicine of Wake Forest College	54	..	1	53	48	3	88.9	
University of North Dakota	40	..	19	21	18	2	45.0	
University of Cincinnati	93	..	4	89	87	6	93.5	
Western Reserve University	82	..	..	82	78	3	95.1	
Ohio State University	150	..	5	145	136	4	90.7	
University of Oklahoma	100	..	39	61	43	4	43.0	
University of Oregon	79	..	28	51	31	2	39.2	
Hahnemann Medical College	108	..	2	106	104	9	96.3	
Jefferson Medical College	178	..	5	173	170	5	95.5	
Temple University	136	..	6	130	127	3	93.4	
University of Pennsylvania	128	..	1	127	125	2	97.7	
Woman's Medical College of Pennsylvania	51	..	2	49	46	5	90.2	
University of Pittsburgh	102	..	3	99	95	6	93.1	
University of Puerto Rico	53	..	4	49	37	..	69.8	
Medical College of South Carolina	80	..	9	71	64	..	80.0	
University of South Dakota School of Medicine	46	..	12	34	33	1	71.7	
University of Tennessee	220	..	135	85	77	3	35.0	
Meharry Medical College	73	1	8	64	51	6	69.9	
Vanderbilt University	53	..	19	34	29	1	54.7	
University of Texas Southwestern Medical School	104	..	32	72	59	7	56.7	
University of Texas Medical Branch	132	..	29	103	73	8	55.3	
Baylor University	86	..	18	68	65	1	75.6	
University of Utah	58	1	25	32	22	5	37.9	
University of Vermont	51	..	..	51	44	2	86.3	
University of Virginia	77	..	4	73	69	4	89.6	
Medical College of Virginia	85	..	7	78	75	3	88.2	
University of Washington	75	..	17	58	46	1	61.3	
West Virginia University	40	..	..	40	33	1	82.5	
University of Wisconsin	90	..	57	33	28	2	31.1	
Marquette University	105	..	4	101	80	14	76.2	
Totals	8,030	13	1,656	6,361	5,790	281	72.1	

States schools. In Canada, however, there was an average for all 12 schools of twice the proportion of students having "C" college records and hence one-third fewer students with "B" college records than in United States schools. Whereas in the latter only one-sixth of the entering medical classes had "C" college grade averages, in Canada more than one-third of the entering students had a college grade average of "C". Six of the 12 Canadian schools did have a higher than average (17.9%) proportion of "A" students in their first year medical classes, with one provincial school having 65% of its students entering with an "A" college grade average. Six Canadian schools had a larger than the over-all Canadian average of "C" students. In fact, three of the schools had more than 45% of their medical students entering with "C" college grade averages. Only two schools had fewer "C" students than the United States over-all average of 16.3% and these schools also had a significantly higher proportion of first year medical students with "A" grade averages in college.

Table 34.—*Comparison of Previous Years and the Current Year of Number and Proportion of Medical Schools Having Entering Classes Consisting Predominantly of Students with College Degrees*

Entering Students with Degrees, %	1954-1955 Schools of 81, No.	%	1955-1956 Schools of 85, No.	%	1957-1958 Schools of 85, No.	%
100	4	4.9	6	7.0	2	2.3
95.1-99.9	11	13.5	14	16.4	13	15.3
90.1-95	7	8.6	6	7.0	12	14.1
Total	22	27.0	26	30.4	27	31.7

Although no comparative data have been assembled, it is possible that Canadian college grades are significantly lower than are grades in United States colleges for similar academic achievement.

PREPROFESSIONAL ATTAINMENTS OF THE ENTERING CLASS

In 1957-1958, 79.2% of the entering class had four years of college and 72.1% had a degree on entering medical school. Those having only three years of college (85 semester hours or more) comprised 20.6% of the entering class. In 1956-1957, 77.5% of the entering class had four years of college, 73% had college degrees, and 22.5% entered medical school after three years of college. Table 33 presents the preprofessional attainments of the 1957-1958 entering medical class.

It thus appears that more students have a longer education before entering medical school than was the case in 1956-1957. Because this appeared to be a trend, a table was begun last year comparing the proportion of medical schools having entering classes made up predominantly of students holding college degrees. Table 34 brings that table to date, with the addition of numbers of schools in each category. It appears that a significant trend is occurring of more schools as well as a greater proportion of schools each year having entering classes consisting of more than 90% of students with degrees. Although four fewer schools in 1957-1958 had classes entirely composed of students with degrees, twice as many schools (six more) had first-year classes in which more than 90% of the students had degrees. This, coupled with a corresponding rise in the proportion of students having four years of college prior to entering medical school and a matching decrease in the proportion who have had only three years of college preparation, demonstrates a trend toward a greater college preparation before entering medical school.

The foregoing applies to the actual attainments of the entering class. Presumably influencing this are the minimum requirements for applicants as submitted to the Association of American Medical Colleges by the medical schools for publication each year in their guidebook.[35] Table 35 compares these requirements for the preceding two years, the current year, and for next year as most recently published. It is apparent that each year more schools require four years of college or a degree as their minimum stipulated to applicants. Although the 1957-1958 year appears to arrest this trend, the requirements published in the 1958-1959 guidebook for applicants to the September 1959 classes again shows an increase in the number of schools requiring four years of college or a degree.

The admission requirements of Canadian medical schools are obscured for those unfamiliar with the Canadian pattern of education in which the high schools have a grade 13 called senior matriculation, approximately equivalent to a first college year, as well as by three Canadian medical schools (Queen's, Ottawa, and Toronto) having the two premedical college years as a responsibility of the faculties of medicine. Taking these facts into consideration, table 13 shows that 10 of the Canadian schools require as a minimum the equivalent of three years of college before entering the basic four-year medical program, and the other two schools (Montreal and Laval) require a college

Table 35.—*Comparison of Admission Requirements, 1954-1955 with 1957-1958*

Stated Admission Requirement*	1954-1955	1956-1957	1957-1958	1958-1959
Less than three years college	1	1	1	1
Three years college	71	73	74	72
Four years college	8	4	8	10
Degree	1	7	2	2
Totals	81	85	85	85

* Each column taken from book "Admission Requirements of American Medical Colleges" (Including Canada), Association of American Medical Colleges, for the year stipulated. However, each column actually applies to next entering class. For example, the school's requirements in the column headed 1957-1958 were submitted by the schools to the Association of American Medical Colleges in the spring of 1957 for publication for guidance of applicants in the autumn of 1957 for the class of 1958-1959.

degree. Information on the preprofessional attainments of Canadian first-year medical students was not available in time for presentation in this report.

MEDICAL STUDENTS ADMITTED TO ADVANCED STANDING

A total of 271 students were admitted to advanced standing in United States medical schools in 1957-1958, 67 into second-year classes, 202 into third-year classes, and 2 into the fourth-year. All but 45 students, who came from foreign schools, transferred from approved medical schools in the United States and Canada. About one-half of the 226 students transferring from approved medical schools were accounted for by students from the four schools of the basic medical sciences.

The 115 students from schools of the basic medical sciences transferred to advanced standing into the third year (with one exception) of 25 United States medical schools and one Canadian school. Those six schools taking about two-thirds (65%) of these transfer students in 1957-1958 were Harvard (22), Medical College of Virginia (17), University of Kansas (13), Northwestern (9), University of Pennsylvania (8), and Southwestern (6).

In the 1957-1958 academic year, 27 medical schools in the United States admitted 45 students to advanced standing from other than approved medical schools in the United States and Canada, with 25 admitted to second-year classes, 18 to the third-year, and one to the fourth-year. Students from medical schools in four countries (Hungary, Switzerland, Netherlands, and Cuba) accounted for 33 or about 73% of the 45 students. Hungarian medical schools alone contributed 12 students, or 26.6% of the total. The remaining 12 students came from schools in eight countries in addition to the foregoing (Germany, Sweden, Italy, Czechoslovakia, Lebanon, Mexico, Poland, and England).

A total of 29 students were admitted to advanced standing in Canadian medical schools in 1957-1958, 10 into second-year classes, 18 into the third-year, and 1 into the fourth-year. Of the 29, 18 students or 62% came from foreign medical schools and 4 transferred from United States schools.

Seven of the Canadian medical schools admitted 18 students to advanced standing from nine foreign medical schools. Of these 18, 11 students or 61% came from Hungarian medical schools. The remaining seven students came from seven schools in six other countries (Switzerland, Scotland, Poland, Netherlands, Ireland, and Germany). The three Canadian schools having two premedical years under the administration of the Faculty of Medicine (Ottawa, Queen's, and Toronto) were excluded in the above analysis insofar as the second year was concerned because of the certainty in the case of three students in one school and the possibility with seven other students admitted to advanced standing in the second year that the premedical or college years were intended rather than the second medical year.

TABLE 36.—*Part-Time or Special Students*

	Study or Research For Degree			Teaching While M. D. Student and Holding Degree			Because of Academic Difficulty	Certain Required Course, Work Elsewhere	Job for Financial Reasons	Other	Totals by Year
	M.A. or M.S.	Ph.D.	Nondegree	Bachelors	Masters	Ph.D.					
1st year	1	1	5	0	4	6	42	3	0	8*	70
2nd year	19	8	14	3	1	8	11	2	1	7†	74
3rd year	17	1	2	2	1	7	16	0	0	3‡	49
4th year	8	0	2	1	0	8	9	0	0	5§	33
Totals by reason	45	10	23	6	6	29	78	5	1	23	226
		78			41						

*Foreign doctor 1
Special student program 4
(Univ. Vermont)
Illness 1
Poliomyelitis 1
Dentist 1
8

†Teaching assistants 2
Poliomyelitis 1
Student research fellowship or assistant 2
Marital difficulty 1
Foreign student 1
7

‡Illness 2
No explanation 1
3

§Experiment in medical education (Univ. Buffalo) 1
Flight training 3
No explanation 1
5

PART-TIME OR SPECIAL STUDENTS

Included in this group are those students who undertook in the 1957-1958 academic year a part-time course of study which will be given credit for the M.D. degree. Not included are those students who withdrew from all courses which would be given credit for the M.D. degree for the purpose of pursuing advanced study. The latter students will be discussed in the next section of this report.

There were a total of 226 part-time or special students in 47 United States medical schools in the 1957-1958 academic year. This was 0.76% of all 29,473 medical students. In order to determine the reasons for these students being in a part-time or special course of study, the medical schools this year were requested to enumerate such students by class in the 10 categories heading table 36. Almost 62% of all the part-time or special students are in their first two years. In fact, one-third are in their first year. It is gratifying to note that only one student was part time solely because of the necessity of earning money in outside employment.

One of the two largest over-all causes for students being part time or special (34%) was academic difficulty (in 18 schools), particularly in the first year (54% of those in this category). This would be expected, as the largest attrition has for years been in the first year of medical school. If one counts the number of students who withdrew because of academic failure or difficulty with those who were part time on this account to obtain a proportion of the total first-year class of 8,030 having serious academic difficulty, it appears that this amounts to 483 students, or 6% of the total first-year class.

TABLE 37.—*Attrition in the Approved* Medical Schools in the United States, 1957-1958*

Year	Enrollment	Failed	Withdrew, Poor Standing	Withdrew, Good Standing	Totals	Enrollment Lost, %
First Year	8,030	350	98	181	629	7.8
Second Year	7,504	153	19	65	237	3.2
Third Year	7,051	50	5	38	93	1.3
Fourth Year	6,888	8	1	13	22	0.3
Totals	29,473	561	123	297	981	

*Includes the three newly developing provisionally approved schools.

Exactly equaling academic difficulty as the cause for part-time or special study is the number of students undertaking advanced study, either for a degree or unrelated to an M.S. or Ph.D. Those 78 students in 18 schools comprise 34.5% of the 226 part time or special students. More than three-fourths of these 78 students were in their second (52.5%) and third (25.6%) years. It should be noted that these figures do not purport to show and should not be interpreted to mean that only 78 of 8,030 medical students undertake advanced study. It simply accounts for one reason for medical students being in special or part-time programs.

In the next largest category are those medical students who are also teaching, usually in a basic medical science in which they have had advanced study. More than 85% of those 41 medical students in 21 schools hold advanced degrees, with about 70% of them Ph.D. degrees and 15% M.S. or M.A. degrees.

Except for five students in the first two years who had had certain required course work elsewhere, the remaining 23 special or part time students are accounted for as stipulated in the footnote to table 36. Particular experiments in medical education by two schools (University of Buffalo and University of Vermont) engage five students, and illness or its effects was the problem with five students. The other 13 students were in part-time or special study for a variety of reasons.

There were only two part-time or special medical students, both men, in Canada. Each was in the second medical year of the University of Saskatchewan. One was teaching as a Ph.D.; the other had had previous academic difficulty.

STUDENTS WITHDRAWING FOR ADVANCED STUDY

Not included in the total of 29,473 medical students in 1957-1958 were 97 students who entirely withdrew in 43 United States schools from all M.D. credit courses to pursue advanced study. All but one of these 97 students withdrew during their first three years of medical school; 84.5% were in their second and third years. The advanced study was toward a graduate degree (M.S. or Ph.D.) other than the M.D. by 47 students (48%), though not degree related in the case of the other 50 students. At least 78 students (80%) of the 97 were pursuing study in the traditional basic medical science disciplines; in addition, one student's field was "biological sciences" and another student's field was given as "nuclear science." Only three students had withdrawn for study in a clearly clinical field (psychiatry). It is not possible to categorize accurately the field of study of 14 of the 97 students because the field as given was "USPHS Fellowship" or "medicine" or "surgery", for example. Considering that 10 of the 14 students withdrew during their second year, it is probable that their fields of advanced study were essentially basic science rather than clinical.

As noted in the section on part-time and special students, neither those students doing advanced study nor students withdrawing from M.D. credit work, nor both together, represent the number of medical students pursuing advanced study, nor the number of schools whose educational programs are sufficiently stimulating to the spirit of scientific inquiry in medical students. The request this year to medical schools for information was not designed to elicit such information but rather to account more fully than previously the reasons for students withdrawing for advanced study and for their being in part time or special M.D. credit programs. It should be recognized that other medical students, perhaps many other students, are pursuing advanced study and research during their unscheduled periods while they are full time medical students.

TABLE 38.—*Comparison of Attrition First-Year Medical Students*

Year	Total First-Year Class	Students Leaving		Students Failing*		Students Leaving, Other Reasons†	
		No.	% of Class	No.	% of Class	No.	% of Class
1954-1955	7,576	418	5.5	257	3.39	161	2.12
1955-1956	7,742	480	6.2	324	4.18	156	2.01
1956-1957	8,014	544	6.8	368	4.59	176	2.19
1957-1958	8,030	629	7.8	448	5.57	181	2.25

*Failed or withdrew in poor academic standing.
†Withdrew in good academic standing for all other reasons.

In each of three Canadian medical schools, one student withdrew from all M.D. credit work in 1957-1958 to pursue advanced study. Each of the three students favored a different field, although all were studying in one of the traditional basic

medical science disciplines. Two of the three were in their first medical year; the other withdrew from the second medical year. Two of the three students were in nondegree related advanced study.

ATTRITION OF MEDICAL STUDENTS

Table 37 presents attrition by class and cause of students lost to medicine in 1957-1958 in United States schools. It was hoped that after receiving responses from the medical schools to identical questions regarding student attrition each year for four successive years, the attrition in a single class of students throughout their four years could be obtained on a national basis. Such did not prove to be the case. It appears that this can be done only on the basis of individual student records rather than on the numerical totals reported.

There has been in 1957-1958 an increase in the number and proportion of students lost because of academic difficulty in the first three years and a decrease in the number and proportion lost for this cause in the fourth year, as compared with previous reports. However, the number of students withdrawing for any cause in the fourth year is too small to warrant conclusions in regard to trends as to cause. With the exception of the 1956-1957 year, when an unusual number and proportion of fourth-year students withdrew in poor academic standing, there has been no significant change for fourth-year classes since 1954-1955, when this information was first regularly compiled.

In 1957-1958, as in the previous three years, about two-thirds of all student losses were in the first-year class. The current data show that 71% of these losses were due to failure or withdrawal in poor academic standing, as compared to 67.6% in the previous two years. The second-year class in 1957-1958 had 72.5% of its losses from this cause, as compared to 64% in 1956-1957 and 62% in 1955-1956. In the current third-year and fourth-year classes, 55.6% of the students lost, failed, or withdrew in poor academic standing, compared to 67% in 1956-1957 and 55% in 1955-1956.

TABLE 39.—*Attrition in the Approved Medical Schools in Canada, 1957-1958*

Year	Enrollment	Failed	Withdrew, Poor Standing	Withdrew, Good Standing	Totals	Enrollment Lost, %
First	1,011	49	2	34	85	8.4
Second	916	35	0	9	44	4.8
Third	928	9	0	6	15	1.6
Fourth	830	1	0	4	5	0.6
Totals	3,685	94	2	53	149	...

Examination of attrition data for the current year and for the past three years shows an increasing number and proportion of students in both first-year and second-year classes withdrawing from medical school. A comparison for the first-year classes is presented in table 38, although a table showing entirely similar trends could be presented also for second-year classes since 1954-1955. It is apparent that the increase in attrition is entirely occasioned by an increasing number and proportion of students failing and withdrawing in poor academic standing. The reason for this is not evident from the data available at this time. That it is not due to earlier identification of poor students is apparent, because if that were a major factor, one would expect a decline of attrition from this cause in second-year and/or third-year classes. Such is not the case. Rather, they have shown similar trends of rising numbers and proportions of students failing and withdrawing in academic difficulty since 1954-1955 to the present. On the other hand, the number and proportion of students withdrawing for all other reasons has shown no significant change for first-year to fourth-year classes since 1954-1955. It has been, in proportion of the total class sizes each year, from 0.6 to 1.0% for second-year classes, about 0.5% for third-year classes, and about 0.21% for fourth-year classes.

TABLE 40.—*Estimates of Median Student Expenses per Year*[a]

Item	Privately Owned Schools (N=45)	Publicly Owned Schools (N=40)	
		Resident	Nonresident
Tuition and fees	$1,002	$500	$830[b]
Room and board (minimum)	806	765	765
Books and supplies (not including microscopes)	150	130	130

[a] Reprinted with slight modification from "Admission Requirements of American Medical Colleges (including Canada), 1958-1959" published by the Association of American Medical Colleges, Chicago.
[b] Excluding one school that accepts no nonresidents in the first-year class; no nonresidents are accepted at six schools.

Table 39 presents by class and cause the attrition of students in the 12 Canadian medical schools for 1957-1958. Comparable data was not presented in previous years. Of the total students lost to medicine for all causes in all classes, 57% occurred in the first-year class and 86.6% in the first two years. Two-thirds of these were due to failure or withdrawal in poor academic standing. This is comparable with, although not exactly the same as, the experience in United States schools. Although, as in the case with United States schools, Canadian medical schools have half of their students lost to medicine in the third and fourth years withdrawing in good standing, both the numbers (10) and proportion (0.56%) of the total classes are small for such attrition.

STUDENT EXPENSES

Table 40 shows the most recent annual expense estimates for medical students at United States medical schools, based on information secured by the Association of American Medical Colleges. As that association pointed out,[36] the figures can be regarded as only rough budget goals. They are subject to change even within the next year, and there

is a considerable range within each of the categories in the table. With tuition and fees, for example, the range is $592 to $1,280 for privately owned schools, $120 to $900 for residents in publicly owned schools, and $416 to $1,300 for nonresidents in publicly owned schools. Tuition in the individual schools is given in table 12 for United States schools and in table 13 for Canadian schools.

TABLE 41.—*Canadian Tuition Fees*

	Publicly Owned (N=7)		Privately Owned (N=5)	
	Resident	Nonresident	Resident	Nonresident
Average 1st Year	$566.68	$585.25	$578.80	$655.80
Average 2nd Year	529.54	558.11	Same	Same
Average 3rd Year	536.68	565.25	Same	Same
Average 4th Year	558.11	566.25	Same	Same
Over-all average	527.75	566.32	578.80	655.80
Over-all median	531.00	531.00	545.00	620.00

It should be emphasized that the living expenses of individual students vary greatly, depending upon their family responsibilities and upon their spending habits.

Table 41 presents by medical school year the average tuition charges in the Canadian medical schools as well as over-all average tuition and over-all median tuition. In order to present meaningful figures, it is necessary to present the averages in the publicly owned schools by year because in three schools (Alberta, Toronto, and Saskatchewan) different tuition fees are charged in the four years of the medical school. Similarly, the over-all averages and medians were obtained by treating each of the four years in each of the 12 schools as a separate tuition figure. This was not necessary in the case of the privately owned schools, which uniformly charge the same fee in each of the four years. The designation private ownership has as much or as little meaning relative to sources of financial support for at least two of the five Canadian schools so categorized as does ownership versus sources of support in many United States schools classified as privately owned.

Table 13 presents tuition charges by individual school. It will be noted that the ranges in tuition are not as broad in Canadian schools as compared to United States schools. Tuition in the publicly owned schools is comparable in the two countries. The lower tuition in the privately owned schools is significant, even allowing for differences in dollar value and purchasing power in the two countries. The range in Canadian publicly owned schools is $391 to $585 for residents, and $391 to $731 for nonresidents. The spread for privately owned schools is $520 to $750 for residents and $520 to $834 for nonresidents.

Estimates of other student expenses, such as for room and board, books, and supplies were not available regarding Canadian students in time for publication in this report.

SCHOLARSHIP AND LOAN FUNDS, 1957-1958

In the questionnaire which largely serves as a basis for this report, information was sought pertaining to the usage of scholarship and loan funds. A large body of data, probably more detailed and complete than has been recently available in regard to usage of these funds, was collected, and pertinent aspects of these data are presented here. Although this material is believed to be nearly complete as it concerns scholarship and loan funds administered in some manner by the medical schools, there is such a variety of sources of funds, particularly for loans, that this study should not be considered as encompassing all scholarship and loan funds utilized by medical students during the 1957-1958 academic year.

The data presented in this section of the report excludes the medical schools still in development. Table 42 depicts some major characteristics of scholarship usage. Because of apparent gross differences in United States schools by the type of ownership, data are presented according to this division as well as for United States schools as a whole.

Although enrollment is almost evenly divided between publicly and privately owned United States schools (approximately 14,000 and 15,000), of the nearly one and a half million dollars expended for scholarships in 1957-1958, only 25% was utilized in publicly owned schools as opposed to 75% in privately owned institutions. This ratio is necessarily reflected in the amount of expended scholarship money artificially distributed over the total student enrollment. In addition, the average dollar value of scholarships, the number of scholarships granted, and the percentage of the total enrollment holding scholarships are all significantly greater in the privately owned schools.

TABLE 42.—*Utilization of Scholarship Funds, 1957-1958 (82 United States and 12 Canadian Schools)*

	United States Schools		All United States Schools	Canadian Schools
	Public (39)	Private (43)		
Scholarship funds expended	$358,638.00	$1,099,229.00	$1,457,867.00	$106,432.00
Scholarship funds expended per students enrolled	26.64	72.78	50.30	45.16
Average dollar value per scholarship	$391.10	$568.67	$511.53	$196.73
Average tuition charge	$487.87	$803.02	$705.75	$540.94
Number of scholarships granted	917	1,933	2,850	846
Percent of enrollment holding scholarships	6.5	12.8	9.9	23.0

On initial thought it might be presumed that the considerably larger scholarship sums distributed over a greater proportion of the student body would render private schools a distinct financial advantage to medical students. However, this advantage is partly offset by higher tuition charge. As indicated in table 42, the average tuition charge for private schools is more than $500 greater than the average for public schools. Of the total tuition charge of

$21,800,000 for the academic year 1957-1958 for all students in United States medical schools, 15 million dollars was assessed by privately owned schools and $6,800,000 by publicly owned schools. Scholarships awarded by private schools reduced tuition charge paid by students to $13,900,000. In public schools, scholarship awards reduced student tuition payments to $6,400,000. The over-all tuition charge borne by students was reduced by scholarship awards for $21,800,000 to $20,300,000.

In an effort to create what might be called an index of scholarship granting performance, United States medical schools according to type of ownership were arrayed in rank order by expended scholarship dollars distributed over the total student enrollment. In effect, the school of the highest order in this array expended in 1957-1958 most scholarship dollars per student enrolled. It is to be emphasized that these data are presented without specific knowledge of the degree to which real student needs were met and must be considered as representing an impersonal relationship between scholarship dollars expended and the number of students enrolled.

Table 43 summarizes this array of scholarship awards "Performance." Although schools are not identified by name, any institution desiring to know where it stands in the rank order can obtain this information by writing to the Council on Medical Education and Hospitals. In table 43, the dollars expended for scholarships divided by the number of students enrolled are presented for the upper, middle, and lower five schools in the rank order. The figure for the median school and the range is presented for each group of five schools. The public school of the highest order ($680.45 for scholarships per student enrolled) in this table is an exception that deserves explanation. A legislative appropriation made it possible to extend scholarships with an average value of approximately $1000 to almost two-thirds of the student body and the total scholarship expenditure, if spread over the entire enrollment, would have provided each student with

TABLE 43.—*Scholarships Awards "Performance" (Dollars Expended per Student Enrolled)*

Schools	Public (39)		Private (43)	
	Median	(Range)	Median	(Range)
Upper Five	$122.76	($680.45-76.55)	$213.15	($260.69-208.85)
Middle Five	11.69	(15.95- 9.66)	27.46	(33.86- 24.57)
Lower Five	0	(1.09- 0)	0	(1.91- 0)

funds more than $100 in excess of tuition costs. This same institution reports no funds available for loan purposes.

In both the publicly and privately owned categories of schools, there are three institutions which by policy grant no scholarships. These six institutions acount for the apparently aberrant figures for the lower five schools.

Forty-four schools reported that all available scholarship funds had been expended and 41 of these same institutions indicate that they could justify the expenditure of considerably greater funds.

Thirty-two schools reported scholarship funds available totaling almost $400,000 that were not utilized. In 24 instances it was indicated that the

TABLE 44.—*Utilization of Loan Funds, 1957-1958 (82 United States and 12 Canadian Schools)*

	United States Schools		All United States Schools	Canadian Schools
	Public (39)	Private (43)		
Loan funds expended	$617,235.00	$680,338.00	$1,297,573.00	$176,614.00
Loan funds expended per student enrolled	44.49	45.04	44.77	47.98
Average dollar value per loan	354.73	471.47	407.66	238.67
Number of loans granted	1,740	1,443	3,183	740
Per cent of enrollment granted, loans	12.5	9.6	10.7	20.1

nonutilization was the result of restrictions imposed by the donor, university policy, or by the committee responsible for administering the funds. Of the 32 schools with unused scholarship funds, 24 state that they could justify the expenditure of additional funds if less restrictive policies governed their use.

Fifty schools indicated that first-year students are eligible for scholarship assistance, and in 27 instances eligibility can be established only after completion of the first year.

Gross characteristics of the utilization of scholarship funds by Canadian medical schools are presented in table 42. The major difference between scholarship fund utilization in Canada and the United States is that their funds are spread over a larger portion of the student enrollment. Scholarship dollars expended amounted to 8.3% of the total Canadian tuition charge (in the United States this was 7.0%).

Eleven of the 12 Canadian schools grant scholarships. Two schools reported unexpended scholarship funds of approximately $2,000, and another did not specify the amount unexpended. Seven schools indicated that additional funds for scholarships could be justified.

Eight schools may award scholarships to students at the beginning or in the course of the first year of medical study, and in two schools students are eligible for scholarships only after completing the first year.

Certain gross characteristics of utilization of loan funds are presented in table 44. The significant differences between publicly owned and privately owned medical schools noted in utilization of scholarship funds are not apparent in loan fund utilization. The major difference is that private schools granted loans of greater dollar value to a somewhat smaller percentage of enrolled students.

As was done for scholarship funds, United States medical schools according to type of ownership were arrayed in rank order by expended loan fund

dollars distributed over the total student enrollment. Again it is to be emphasized that these data must be considered as representing only an impersonal relationship between loan funds expended and the number of students enrolled during 1957-1958, since this material is presented without specific knowledge of the degree to which real student loan needs were met.

TABLE 45.—*Loan Granting "Performance" (Dollars Expended per Student Enrolled)*

	Public (39)		Private (43)	
Schools	Median	(Range)	Median	(Range)
Upper five	$115.34	($790.96-73.74)	$126.76	($384.75-108.97)
Middle five	36.21	(38.23-34.60)	29.91	(34.78- 29.18)
Lower five	10.28	(11.94-6)	7.32	(7.99- 1.17)

Table 45 summarized this data; the dollars expended for loans divided by the number of students enrolled are presented for the upper, middle, and lower five schools in the rank order. The figure for the median school and the range is presented for each group of five schools.

The public school of the highest rank order ($790.96 for loans per student enrolled) in table 45 is a two-year institution whose graduates must transfer to medical schools in other states to complete the last two years of medical school study. A few years ago, the state legislature authorized loans up to $2,000 per student per year not to exceed $75,000 in total loans a year for graduates of the granting school while they complete their last two years of study elsewhere. Grantees must be residents of the granting state and must agree to return to that state to practice. Slightly greater sums may be loaned to students who agree to practice in specified small communities in the state; in addition, for each year practiced in such a community, the borrower is forgiven for one-fifth of the loan and interest.

All but one school in the United States and one in Canada granted loans during 1957-1958. Of the 81 United States schools granting student loans (developing schools are not included in this data), 28 utilized all loan funds available, and all but one of these indicated a need for additional funds. In 53 United States schools, loan funds were available that were not completely used. In 21 instances funds were not used in order to maintain a reserve for use in other years or in emergencies; in 15 instances the funds on hand exceeded the student demand; there were 11 schools in which restrictions imposed by donors, university policy, or the committee administering the fund prevented full utilization; in six responses the reason for incomplete utilization was not stated.

About half of the schools in which loan funds were not completely used indicated no need for additional funds for loan purposes. It should be pointed out that probably all schools have established conditions which must be met in order for a student to be eligible to receive a loan. There are, therefore, always some restrictions that govern student loan policies so that responses indicating restrictions as the reason for incomplete utilization of loan funds are in reality dealing with the degree of restriction which manifestly is not assigned a uniform meaning from one institution to another. Without uniform standards and policies for both scholarship and loan fund assistance, it is not possible to interpret the degree of student need or the amount of student need that is being met by these funds.

Canadian schools grant smaller, average loans to a greater segment of their student body than do schools in the United States (table 44). Only one Canadian school has no provision for granting student loans and it indicates a need for such a program. Of the remaining 11 schools, 8 did not utilize all loan funds available, and 6 of these state that funds on hand were in excess of expressed student need. One school was unable to use all funds because of restrictions and another because of the need to maintain a revolving reserve. Both of these as well as two of the three schools which had utjlized all available loan funds indicated a need for additional sums for student loan purposes.

Forty-three schools in the United States and 7 in Canada may grant loans in the course of the first year of medical school study. Thirty-eight United States and 4 Canadian schools by policy grant loans only after completion of the first year.

Table 46 expresses utilization of scholarship and loan funds as the percentage of tuition charges which funds expended in 1957-1958 could have underwritten. The combined total of scholarship and loan funds for Canadian schools represents a sum equivalent to 17.5% of their tuition charges. In United States schools under public ownership, greater emphasis is placed on student loans as opposed to schools under private ownership in which most emphasis is on scholarships. Perhaps this is to be expected since tuition charges are higher in private schools and scholarship awards would more certainly be directed toward payment of tuition. Although in public schools (United States) grants of scholarships and loans represent a greater percentage (14.4%) of their tuition charges than grants of private schools (11.9%)

TABLE 46.—*Expended Scholarship and Loan Funds as Percentage of Tuition Charges*

	Scholarship Funds, %	Loan Funds, %	Scholarship and Loan Funds, %
United States Schools			
Public	5.3	9.1	14.4
Private	7.3	4.5	11.9
Total	7.0	6.0	12.8
Canadian Schools	8.5	9.0	17.5

again because of higher tuition charges, the smaller percentage for private schools actually represents a greater absolute sum of money.

STUDENT EMPLOYMENT PRACTICES

To obtain information about outside work done by students for remuneration during the course of medical school studies, schools were queried regarding certain aspects of student employment practices.

Thirty-nine United States schools indicated knowledge of the percentage of each class which engaged in part time employment during the 1957-1958 school year. The school of these 39 that falls in the median position has 7.1% of its first-year class in outside employment. The range of percentage of first-year classes working is from 80% to 0% (in five of the 39 schools, there were no first year students working). The median school for the second year class had 18.5% working with a range of 91% to 0% (three schools in the latter category). The median school for the third-year class had 30% with a range of 90% to 0% (three schools), and for the fourth-year class 40% with a range of 90% to 0% (five schools).

Thirty-nine United States schools reported knowledge of the percentage of students in the second, third, and fourth year classes who were employed (1957-1958) during the school year as externs in hospitals not affiliated with the school for teaching purposes. Ten of these schools reported from 20% to less than 1% of the second year class held positions in nonteaching hospitals as externs during the school year. Twenty-eight of the 39 schools reported that from 34% to 1% of the third-year class were working as externs in nonaffiliated hospitals. Thirty schools of this group reported from 56.5% to 1% of the fourth year class externing in such hospitals during the school year.

From these data it is not possible to estimate accurately the total number of medical students who do part-time work as externs in hospitals not affiliated with medical schools. It seems apparent that there are significant numbers of students, including some in the second-year of medical study, holding such posts. Inevitably these students acquire additional experience in medicine, but, under the circumstances, serious questions can be raised as to whether this experience augments or detracts from the educational efforts of the medical school.

Since the hospitals are not affiliated with medical schools, it can be presumed that for the most part at least this experience is not acquired under the supervision of teachers directly responsible for the students' medical education. It is also possible and perhaps probable that in many instances there may be little if any competent supervision. The same reasons that give cause for concern of exploitation of the student, to the detriment of his sound educational development, also point to a concern that patients given hospital care in such situations cannot have assurance that sufficient judgment and competence are a common basis for all components of the care rendered.

GRADUATES

As was predicted a year ago, the number of graduates in the United States was larger in 1957-1958 than it had been in the previous two years, although it was not as large as the 1954-1955 graduating class, which included as graduates the 50 students completing the intern year required by Stanford University (table 21).

The net increase of 65 graduates in 1957-1958 as compared to 1956-1957 occurred because 38 schools had a total of 274 more graduates, partially offset by 42 schools having 209 fewer graduates, with no change in class size in 5 schools. Twelve schools had a more than 10% increase in number of graduates, the greatest being in schools having recently developed four-year programs such as Mississippi (up 83.4%), Miami (76.5%), and Missouri (52.4%). Other increases occurred also in Albany (22.4%), Buffalo (20%), Medical College of Georgia (19.2%), and Texas Medical Branch at Galveston (up 17.1%). Eleven schools had a decrease of graduates of more than 10%. The largest decreases were in Maryland (down 17%), Utah (15.8%), Baylor (13.3%), Vanderbilt (13.2%), Georgetown (12.1%), and University of Virginia (12%).

Based on the size of the 1957-1958 third-year class, it appears that the graduating class of 1958-1959 will be larger than any prior graduating class except that of 1954-1955. However, the second-year class size in 1957-1958, greatly augmented by the students in the developing schools in 1956-1957 and currently, indicates that a greater increase in number of graduates will occur in 1959-1960. That class will probably set a new record high for number of graduates.

The schools, medical students, and graduates in the Canadian medical schools for the past 10 years appear in table 24. Beginning with the graduating class of 1956-1957, all 12 of the Canadian schools were four-year medical schools. Comparing graduates in the individual schools in the current year and the previous one shows that seven schools had an increased number of graduates in 1957-1958, while five schools showed a smaller number of graduates in 1957-1958, for an over-all decrease of 65 graduates (down 7.2%). Though six schools (Saskatchewan, Dalhousie, Ottawa, Montreal, Alberta, and McGill) had a greater than 10% increase in number of graduates, three schools had a more than 14% decrease (Western Ontario down 33.4%, Queen's down 19.6%, and Toronto down 14.4%). However, based on the size of the third medical year class in 1957-1958, it is anticipated that the number of medical graduates in 1958-1959 will be significantly greater, possibly the largest number of graduates in the past 10 years.

THE NEXT ENTERING CLASS

Based on estimates submitted by the medical schools in the United States, the 1958-1959 entering class may be somewhat larger than was the 1957-1958 class. A total of 11 schools expected an increased number of entering students and 74 schools anticipated no change in their class sizes. No additional schools will enroll students for the first time in 1958-1959. On the other hand, there was a trifle smaller number of applicants in 1957-1958 than there were in 1956-1957 (15,791 as compared to 15,918), indicating that the increased number of applicants in 1956-1957 over the previous year may not have presaged currently a trend toward significantly more applicants over-all.

Canadian schools anticipated a slightly smaller entering class in 1958-1959 than in 1957-1958, based on three schools expecting to take fewer entering students while the remaining nine schools expected no change in class size.

TABLE 47.—*Foreign Students in Medical Schools in the United States*

Area	Countries, No.	Students, No.
Far East	14	79
Near and Middle East	12	46
Europe	16	66
Latin America		
Caribbean	5	39
Central America	6	24
South America	8	26
North America	1	1
Africa	9	26
Oceania	3	4
Total	75	312

INTERNATIONAL EDUCATIONAL EXCHANGE IN MEDICINE

In order to provide an appropriate setting for educational exchange in medicine, the following is quoted [97] from the introductory paragraphs of *Open Doors 1958*, the most recent report on international exchange published by the Institute of International Education.

TABLE 48.—*Foreign Citizens Enrolled in Entering Class of United States Medical Schools*

School Year	Foreign Students in Entering Class, No.
1954-1955	94
1955-1956	97
1956-1957	92
1957-1958	78

The statistics in *Open Doors 1958*, the report on the five surveys conducted by the Institute of International Education during the academic year 1957-1958, emphasize the growing interest in international educational exchange. Never before have such large numbers of students, faculty members and physicians traveled to and from the United States for educational purposes. There were 52,355 foreign citizens on educational assignments in the United States during 1957-1958; this represents more than a 7% increase over 1956-1957 when 48,560 foreign citizens were reported. Of the 52,355, 43,391 were foreign students; 1,342 were foreign lecturers, professors or researchers who had received appointments to American faculties and 7,622 were foreign interns and residents at United States hospitals. Academic institutions reported 1,689 United States faculty members in teaching or research at the university level abroad. The figures on American students at foreign institutions of higher education cover the 1956-1957 academic year. The results of this survey were delayed because of the time required to receive replies from schools overseas. A total of 12,845 United States students were enrolled in foreign educational institutions in 1956-1957. Primary and secondary school teachers and students are not recorded in *Open Doors*.

The foreign nationals included in Open Doors are citizens of other countries who have come to the United States for educational purposes and who intend to return home upon completion of their assignment. In some cases, however, Hungarian refugee students, whose futures are uncertain, were reported and they have been included. Institute of International Education information indicates that the total number of Hungarian students in residence this year was, however, larger than the 511 reported.

The exchanges represent every major geographical and political area of the world. As in previous years the largest number of exchanges came to the United States from the Far East and the second largest number from Latin America. Thirty-three per cent of all foreign nationals in the United States came from the Far East and 20.9% from Latin America. European, Near and Middle Eastern, and Canadian citizens followed in that order. The new emphasis on academic exchanges with the countries of Eastern Europe has increased the European totals only slightly. Africa and the countries of Oceania are represented again this year by small numbers of exchanges.

TABLE 49.—*United States Citizens Studying Medicine Abroad**

	Total United States Students Abroad	United States Students in Medicine Abroad*
1954-1955	9,457	1,386
1955-1956	9,887	1,963
1956-1957	12,845	(2,000-2,200 ?)

* Excludes United States students studying medicine in Canada.

The majority of United States citizens abroad—faculty members in 1957-1958 and students in 1956-1957—were located in Europe. The numbers going to Mexico and Canada increased, but as in previous years few Americans pursued their studies in Africa and the Near and Middle East.

The Institute's report indicates that of the more than 43,000 foreign students in the United States (89% of queried institutions responded), most were enrolled in courses in engineering (approximately 10,000) and least in agriculture (approximately 800). Of particular interest are the approximately 750 foreign students enrolled in premedical studies, approximately 1,000 in medicine (undergraduate and graduate but excluding internship and residency) and approximately 1,500 as undergraduate or graduate students in the general field of biological sciences.

FOREIGN SCHOLARS SERVING ON UNITED STATES FACULTIES

There were reported about 1,350 visiting foreign scholars (including professors, instructors, lecturers, and advanced researchers) who served on the faculties of 233 United States colleges and universities

during the 1957-1958 academic year. Included in this group were almost 300 foreign scholars serving on United States medical faculties.

FOREIGN STUDENTS (EXCLUDING CANADIANS) ENROLLED IN UNITED STATES MEDICAL SCHOOLS

In 1957-1958 there were a total of 312 foreign students enrolled in United States medical schools (table 47). These students represent 75 different countries and are studying medicine in 65 United States schools. Included in this total of 312 are 73 foreign citizens who were admitted to the entering classes of 33 schools. As is evidenced in table 48 this represents a decrease over recent years.

In addition, 45 foreign students were admitted with advanced standing to the upper classes of 30 United States schools after varying years of medical study abroad. Forty-four of these students were admitted to the second (25) or third (19) year classes, and one was accepted as a senior student. The 45 foreign students admitted with advanced standing and the 73 accepted in the entering class are included in table 47. Canadian citizens are not included in these tables but are considered in the section of this report entitled, "Enrollments and Geographic Source of Entering Students."

A comparison of the number of foreign students in United States medical schools (table 47) with the number of United States citizens studying medicine abroad (table 49) is of interest. These data show from 1,700 to 1,900 more United States citizens enrolled in medical schools abroad than there are foreign citizens enrolled in United States medical schools. From a numerical standpoint, this provides for the United States a favorable balance of positions in medical schools for its students equivalent to four to five additional schools of average United States enrollment. A more qualitative view of this balance is presented in the editorial section of this issue of THE JOURNAL.

TABLE 50.—*Leading Nationality Groups of Foreign Physicians in the United States*

Nationality Group	Physicians, No.
Philippine Islands	1,598
Turkey	587
Canada	535
Mexico	500
Germany	319
Korea	313
Greece	280
Iran	279
Japan	275
Italy	230
India	225

FOREIGN PHYSICIANS TRAINING IN UNITED STATES HOSPITALS

The Institute of International Education's survey of foreign physicians training in United States hospitals was done in cooperation with this Council. Questionnaires were sent to the 1,405 hospitals approved for internships and/or residencies, with 81.1% of the polled hospitals responding.

According to *Open Doors 1958*:

During 1957-1958, 7,622 physicians from 90 countries trained in 821 United States hospitals. Of the 7,622, 5,543 trained as resident physicians and 2,079 as interns. The total represents a general increase of 881 physicians over the 6,741 reported last year. This year physicians accounted for 14.5% of the total foreign citizen population surveyed by the Institute of International Education (table 50).

TABLE 51—*Eight Hospitals with More Than Fifty Foreign Physicians*

Hospital	No.
Bellevue Hospital Center, New York	90
Boston City Hospital	80
Cleveland Clinic Hospital	69
Memorial Center, New York	68
Michael Reese Hospital, Chicago	64
Kings County Medical Center, New York	59
Jersey City Medical Center	53
City Hospital, Cleveland	51

The general increase in the number of foreign physicians was not limited to any particular area. Canada and the countries of Oceania showed a decrease in the number of physicians sent to this country, but an increase was recorded from the Far, Near and Middle East. The greatest increase, one of more than 25%, was shown by Africa.

Of the total number of physicians 1,649 or 21.9% were women. This is an increase of 8.1% over 1956-1957 when only 13.5% were women. Sixty per cent of these women were from the Far East and almost half, 44%, were from the Philippines. As in last year's survey, the Philippines accounted for the largest number of doctors, and approximately half of the doctors sent from the Philippines were women.

Foreign residents were reported in 36 fields of specialization. General surgery attracted the largest number of residents with general medicine, obstetrics, gynecology, pathology, psychiatry, pediatrics, anesthesiology, and internal medicine following in that order.

Foreign physicians were training in 45 states, the District of Columbia, Hawaii, and Puerto Rico. More than 25% of all foreign physicians were located in New York and eight hospitals reported more than 50 foreign doctors (table 51).

UNITED STATES FACULTY MEMBERS ABROAD

During the 1957-1958 academic year, approximately 1,700 faculty members from some 350 United States colleges and universities accepted teaching and/or research assignments in other countries. Of this group, about 100 were members of medical faculties.

UNITED STATES STUDENTS STUDYING MEDICINE ABROAD

In previous reports, the Institute of International Education has collected data on the total number of United States students studying abroad and also the numbers by major fields of study. These data have always been for the academic year preceding the year of the report. *Open Doors 1958* presents the total number of United States students studying but does not break that down into major fields of study. However, by interpolating from previous Institute of International Education data, it can be estimated that in the academic year 1956-1957

there were in the range of 2,000 to 2,200 United States citizens enrolled in medical schools outside the United States and Canada (table 49).

As has been noted previously in the annual reports on medical education, the large number of United States citizens enrolled in medical schools outside the United States and Canada must be viewed with serious concern. During the three academic years covered in table 48, the ratio of applicants to admissions in United States schools has been in the range of about 2:1. Under these circumstances, it appears likely that many of the increasing number of American students now studying medicine abroad were not considered qualified for such study in United States schools.

It has been possible for the past several years to collect information regarding the numbers of American-born graduates of medical schools outside the United States and Canada who have received their initial medical licenses in the United States. This is presented in table 52. It is to be noted that the increase of more than 100 such licenses issued in 1957 over 1956 is almost entirely accounted for by New York. Of the total initial licenses issued in 1957 to American-born graduates of foreign medical schools, 70% were granted by the state of New York.

TABLE 52.—*Initial United States Licenses Issued to American Graduates of Foreign (Excluding Canada) Medical Schools*

Year(s)	Licenses Issued, No.	States, No.
1950-1954	99	20
1955	89	19
1956*	?	15
1957*	232	17

* Includes number of licenses issued by New York (1956—50 and 1957—151) and Pennsylvania (1956—0 and 1957—9) which were not available in other years.

It probably is of equal or even greater pertinence to know how many American-born graduates of foreign medical schools failed initial state board examinations. It is hoped that such information can be collected for presentation in next year's report.

THE EDUCATIONAL COUNCIL FOR FOREIGN MEDICAL GRADUATES

This new organization whose program has been presented previously [28] went into active operation in October, 1957. The initial evaluation of a group of foreign trained physicians took place in the United States in March, 1958. Of 298 graduates of foreign medical schools whose medical credentials were found adequate, 51% (152) demonstrated satisfactory knowledge of medicine and English and were certified to this effect by the Educational Council for Foreign Medical Graduates.

Another examination of knowledge in medicine and English was conducted early this fall both in the United States and in approximately 30 testing centers abroad.

Several state licensing boards and several specialty boards have already indicated that they will require graduates of foreign medical schools to be certified by the Educational Council for Foreign Medical Graduates as a prerequisite to examination for licensure or specialty certification.

The Council on Medical Education and Hospitals, in collaboration with the Executive Council of the Association of American Medical Colleges, has prepared and circulated widely in the United States and other countries a statement indicating their support of the Educational Council for Foreign Medical Graduates. These two groups state their intention to withdraw by Jan. 1, 1960, the listing of certain foreign medical schools whose graduates have been recommended for consideration on a basis comparable to that of graduates of our own approved schools.

In place of this listing, the Council on Medical Education and Hospitals and the Association of American Medical Colleges recommend that licensing boards, hospitals, specialty groups, and other organizations in the United States concerned with the medical qualifications of graduates of foreign medical schools, consider certification by the Educational Council for Foreign Medical Graduates as evidence that the recipient of such certification is possessed of medical knowledge comparable to that expected of graduates of approved medical schools in the United States and Canada. In the interval before the Jan. 1, 1960, effective date of withdrawal of the listing of certain foreign medical schools, the Councils concerned will support the recommendations in regard to graduates of the listed schools and also the recommendation pertaining to certification by the Educational Council for Foreign Medical Graduates.

The Council on Medical Education and Hospitals has revised its *Essentials of Approved Internships and Essentials of Approved Residencies and Fellowships* to indicate that hospitals considering foreign medical school graduates for internship or residency positions are recommended to acquire reasonable assurance regarding the medical qualifications of foreign trained physicians by deferring their appointment until the candidates have been certified by the Educational Council for Foreign Medical Graduates. The American Hospital Association has supported this recommendation through appropriate notification of its member hospitals. It is expected that all graduates of foreign medical schools serving as interns or residents in United States hospitals as of July 1, 1960, will have been certified by the Educational Council for Foreign Medical Graduates.

POSTGRADUATE MEDICAL EDUCATION

A detailed study was not undertaken for the 1957-1958 year of enrollments in postgraduate courses for the continuation education of physicians

or of the categories and numbers of courses and the methods of education. A fairly definitive analysis of those activities based on information collected in the year beginning Sept. 1, 1956, was presented in the 57th annual report [39] a year ago. It was felt that no useful purpose would be served by collecting and analyzing similar data for the current year. Further, the information secured from the organizations and institutions sponsoring postgraduate courses in 1956-1957 is still under study, particularly those items concerned with the geographical residence of the physicians enrolled in courses as compared to the locations of the courses offered and their subjects. Already a singular and unexpected mobility of many physicians who travel considerable distances to postgraduate courses has appeared as a significant factor. It is anticipated that the geographical study, which will be published in the next year, should provide information useful to those sponsoring postgraduate courses and related programs.

The annual list, Postgraduate Courses for Physicians, for the calendar year beginning Sept. 1, 1958, was published in THE JOURNAL, Aug. 16, 1958.[39]

EDUCATIONAL VALUES OF THE GRANTS AND TRAINING AWARDS PROGRAMS OF THE UNITED STATES PUBLIC HEALTH SERVICE

Because of their rapid growth since 1945 and their contribution and impact on undergraduate medical education, graduate education and training, and on the research activities and potentials of medical schools, any current report on Medical Education in the United States would be incomplete without presentation of the Educational Values of the Grants and Training Awards Programs of the United States Public Health Service. The following information reviewing the current status of these programs was prepared and submitted by the Office of Research Information, National Institutes of Health, Public Health Service, United States Department of Health, Education, and Welfare.

The United States Public Health Service conducts three types of programs that contribute significantly to America's supply of personnel in the medical and biological sciences. Directly concerned with research manpower are the programs that provide training grants and fellowships to nonfederal institutions and scientists. These awards will aid approximately 6,000 persons in 340 schools in 1958. Of greater magnitude, but offering educational values only indirectly, are the programs of grants for research and research construction. Lastly, there are the various intramural training programs in the Service's research centers and 72 hospitals. All these activities have grown rapidly since World War II. They have greatly increased the research and training potential of schools, have fostered activity in needed areas of investigation, and have advanced the search for basic causes of disease. They have helped expand medical knowledge and the body of professional workers skilled in its application.

The National Institutes of Health, Public Health Service research center at Bethesda, Md., spends more than two-thirds of its annual appropriations for support of nonfederal research projects and research training. The importance of National Institutes of Health to the nation's science structure and medical progress is reflected in the postwar appropriations made by Congress for research fellowships, training awards, and research grants (table 53).

A wide range of medical and biological investigations is conducted and supported by the seven institutes—the National Cancer Institute, National Heart Institute, National Institute of Allergy and Infectious Diseases, National Institute of Arthritis and Metabolic Diseases, National Institute of Dental Research, National Institute of Mental Health, and the National Institute of Neurological Diseases and Blindness. In addition to these institutes, five

TABLE 53.—*National Institutes of Health Appropriations for Grants and Awards to Nonfederal Institutions, Agencies, and Individuals for Fiscal Years 1945, 1950, and 1955-1958*

Year	Research Fellowships	Training Awards	Research Grants
1945	$ 29,000	$ 29,000	$ 85,000
1950	1,448,057	6,415,000	13,005,514
1955	2,502,000	11,051,000	33,918,000
1956	2,800,000	14,502,000	38,038,000
1957	5,397,000	28,075,000	80,697,000
1958	6,812,000	32,560,000	90,345,000

divisions of the Public Health Service share in the responsibility for research project and training awards. One of these, the Division of Research Grants, coordinates the grants and training programs of the institutes and administers awards programs not falling within the seven disease categories.

Nine national advisory councils, composed of nonfederal leaders in medical science and public affairs, review all grant applications within their respective program areas and recommend action to the surgeon general. They are assisted by 28 study sections—panels of outstanding specialists, mostly nonfederal, who are selected by the Division of Research Grants. In addition to these specific functions, the councils and study sections, as well as various special committees, contribute over-all policy guidance in the research grant and training activities.

Below are brief descriptions of the Public Health Service programs that offer educational values. (Further information may be obtained from the Division of Research Grants, National Institutes of Health, Bethesda 14, Maryland.)

Research Fellowships

Six classes of research fellowships are available from the National Institutes of Health to qualified United States citizens (or persons who have filed a Declaration of Intent). Predoctoral, postdoctoral, and special research fellowships are awarded to individual applicants. Senior research fellowships and student part-time research fellowships are available through schools of medicine, dentistry, nursing, and public health. Post-sophomore research fellowships are available through schools of medicine and dentistry. Applications are processed by the Division of Research Grants, and the awards are made on a competitive basis upon recommendation by scientific committees.

The predoctoral research fellowship enables students with a bachelor's degree, master's degree, or equivalent training to pursue graduate research in the health sciences. Predoctoral fellowships are awarded for one year with assurance of support to the degree status if work continues to be satisfactory. Annual stipends for the first, second, and third years are $1,600, $1,800, and $2,000 respectively. The fellowship provides tuition, allowances of $350 for dependents, and certain travel expenses.

The postdoctoral research fellowship is awarded to candidates having an M.D., Ph.D., D.D.S., or equivalent degree. It carries a stipend of $3,800 for the first year, $4,200 for the intermediate year, and $4,600 for the third year. Dependency allowances are the same as for the predoctoral research fellowship. This year, for the first time, several postdoctoral fellowships were awarded to European scientists, enabling them to train at American medical research centers of their choice. This extension of the program is intended to promote exchange of ideas and knowledge.

Special research fellowships are awarded to qualified applicants with unusual competence in research or specialized research training. The stipend for each fellowship is determined at the time of award.

Senior research fellowships encourage highly competent scientists to conduct research in the preclinical sciences—anatomy, physiology, biochemistry, microbiology, pharmacology, pathology, biophysics, genetics, and the behavioral sciences. This program provides support between the completion of postdoctoral training and the time of eligibility for appointment to higher academic posts. Applicants must be sponsored by a basic science department of an accredited medical school, dental school, or school of public health. The fellowship provides a salary determined by the sponsoring institution. Partial research expenses up to $2,000 a year are also financed. Fellows are free to modify their research approach, to obtain additional support from the Public Health Service or other sources to conduct a portion of their research in other institutions, and to assume teaching responsibilities conducive to their academic development.

Student part-time research fellowships are designed to permit students to explore the field of research. Medical schools may request up to eight part-time fellowships in units of $600 each. Dental schools may request up to six units; schools of nursing and of public health up to four. Each unit provides for part-time research during the school term or for full-time research during two months of any period when curriculum work is not scheduled for the student.

A new type of award, the postsophomore research fellowship, was instituted in 1957. It enables medical and dental schools to help students interested in research careers to obtain essential training in the basic sciences. Participants drop out of regular course work during the training period. They receive full tuition, dependency allowances, and a stipend set by the school not to exceed $3,200.

Visiting Scientist Program

The visiting scientist program is a flexible arrangement for inviting outstanding American and foreign scientists to utilize the extensive laboratory and clinical research resources of the National Institutes of Health. Two classes of appointment are available—"visiting scientist" and "research associate in the visiting scientist program." Participants must have a doctoral degree or the equivalent background, at least six years of postgraduate experience, and exceptional ability in a specific research problem. The salary range is from $5,400 to $12,600 a year. The purpose of the program is to increase the utility of the National Institutes of Health as a national resource and to strengthen interrelations with the broader scientific community.

Training Grants

The training grants program of National Institutes of Health is intended to augment the nation's supply of qualified scientific investigators by assisting in the establishment, expansion, and improvement of training and instructional programs in professional institutions. Training grants are made to schools of medicine, dentistry, nursing, and public health. Direct aid to the institution is provided by grants in two general classes—undergraduate and graduate.

Undergraduate training grants are awarded by the National Cancer Institute, National Heart Institute, and National Institute of Mental Health. The specific purpose of this program is to establish, continue, expand, or improve instruction relating to the prevention, diagnosis, and treatment of cancer, mental illness, and cardiovascular disease or related gerontological conditions.

Graduate training grants are awarded by all seven of the institutes. The objective is to assist professional schools in establishing and maintaining graduate instructional and training programs of high caliber as well as to make funds available for the payment of trainee stipends.

Mental health career investigator grants, awarded by the National Institute of Mental Health, provide psychiatrists and scientists in related disciplines with an opportunity to acquire three to five years of full-time research training in mental health. The applicant institution, which may be a psychiatric research institution or a department of psychiatry in a medical school, pays the trainee a stipend ranging from $6,000 to $10,000 a year.

Two additional training grant programs were recently established by the National Institutes of Health—an experimental program for training undergraduate medical students in research methodology and a program of a graduate training grants in epidemiology and biometry. Both programs are administered by the Division of Research Grants. The experimental training program offers special grants to universities seeking to improve methods for training medical students for research careers. The funds paid to applicant schools include salaries of professional and nonprofessional personnel and stipends for individuals in training.

Traineeships

Traineeship awards are intended to increase the number of investigators by encouraging advanced training in specialized areas of medical research. Examples of interest are the neurological diseases, ophthalmology and sensory diseases, diagnosis and treatment of cancer, and arthritis, diabetes, and other metabolic diseases.

Regular or special traineeships are awarded directly to American citizens having a doctoral degree in health fields, including related biological and behavioral sciences. Traineeships are available through the National Cancer Institute, the National Institute of Arthritis and Metabolic Diseases, and the National Institute of Neurological Diseases and Blindness. The National Heart Institute and the National Institute of Mental Health provide traineeships under training grants awarded to institutions for this purpose.

The regular traineeship carries a first-year stipend of $3,800, a second-year of $4,200, and a third-year of $4,600, plus dependency allowances of $350 and certain travel allowances. No allowances are made for tuition or supplies.

Special traineeships are awarded in varying amounts to qualified individuals who possess unusual competence for training or who require specialized training for a specific problem. The trainee may study at the institution of his choice. The stipend is determined by the particular training needs of the applicant. The National Institute of Neurological Diseases and Blindness awards special traineeships only to those who have completed residency requirements in a specialty.

Recent amendments to the Public Health Service Act provide traineeships for professional health personnel, supplementing the training activities of state and local governments. The program is administered by the Division of General Health Services, Bureau of State Services. Its primary purpose is to bring new people into the field of public health—physicians, dentists, nurses, and other professional health workers who have completed their basic education. Preference is given to applicants under 35 who have had no more than two years experience in public health work and have had less than a year of graduate or specialized training in public health. Consisting of stipends, tuition, and certain allowances, the awards are paid directly to participants, with the exception of those made available through schools of nursing and of public health. Stipends range from $2,400 to $4,800, according to the applicant's academic degree.

Another amendment to the Public Health Service Act provides traineeships to prepare nurses for teaching, supervision, and administration in all fields of nursing including public health. Stipends of $2,400 to $3,600 plus tuition, certain travel fees, and dependency allowances of $360 are available through schools of nursing. This program is administered by the Division of Nursing Resources, Bureau of Medical Services.

Research Grants

Research grants support medical research on all major health problems and in basic sciences related to medicine. Each institute makes grants for research within its area of interest, and the Division of Research Grants supports studies outside the scope of the seven institutes. The program is intended to increase research in medical, dental, and other professional schools and institutions and to stimulate investigations in scientific areas needing exploration. A sizable portion of the grants is devoted to basic research. The program aids indirectly in training junior personnel employed in the research projects.

The research grants constitute by far the largest program of Public Health Service awards, both in terms of money expended and the number of institutions affected. Appropriations supported approximately 6,000 such grants in 1957.

Field investigation grants, awarded by the National Cancer Institute, support developmental research, community studies, and surveys that will contribute to the prevention, control, diagnosis, and treatment of cancer in the general population.

The National Institutes of Health cooperate with the two service bureaus of the Public Health Service in administering grants for special research projects. Among these are investigations of the

health aspects of air and water pollution, projects for the development and utilization of hospital facilities and resources, and studies to improve nursing education and service. The projects are administered by the Division of Research Grants for the sponsoring divisions in the Bureau of State Services (the Division of Sanitary Engineering Services and the Division of General Health Services) and in the Bureau of Medical Services (the Division of Hospital and Medical Facilities and the Division of Nursing Resources).

Health Research Facilities

In 1956 Congress approved a three-year program of construction grants to accelerate the building and equipping of urgently needed new laboratories and other health research facilities. Thirty million dollars was appropriated and granted in fiscal year 1957; another 30 million dollars has been appropriated for 1958; and present authorization includes 30 million dollars for one additional year. Applications submitted by nonfederal public and private institutions to the Division of Research Grants are evaluated by the National Advisory Council on Health Research Facilities, which in turn recommends action to the surgeon general. The construction projects are financed on a matching basis.

Training for Public Health Service Careers

The Public Health Service, in its widespread and diversified programs, offers many career opportunities to competent physicians. Training is provided in various areas of medicine, including patient care, clinical research, basic laboratory research, epidemiology, preventive medicine, quarantine duty, foreign service, and public health administration.

Most of the Service's physicians are officers in the Commissioned Corps, which has served this country with distinction since 1873. A young physician or medical student may enter the Corps (1) through the Commissioned Officer Student Training and Extern Program (COSTEP), (2) as an intern upon graduation from medical school, and (3) as a medical officer after non-Service internship.

Clinical assignments are available in most of the Service's 16 general and special hospitals and in many of its 56 hospitals for American Indians and Alaskan natives. Postgraduate medical education in the teaching hospitals is conducted by chiefs of service (who are certified or eligible for certification by their specialty boards), with the assistance of well-qualified personnel and outstanding consultants from local hospitals and medical schools. Approved internships are also offered in dentistry, dietetics, and pharmacy.

Rotating internships consisting of assignments planned to round out a young physician's education are available in the Service's hospitals at Baltimore, New Orleans, New York, Norfolk, San Francisco, Seattle, and Boston. The schedule provides four months of medicine, four of surgery, two of pediatrics, and two of obstetrics. Mixed internships, available at the Public Health Service hospital in Boston, provide six months of medicine and six of surgery.

In addition to the usual educational requirements, the applicant for appointment as a medical intern must (1) be in good health, (2) be an American citizen, and (3) submit an application for a reserve commission in Public Health Service. Those who have satisfactorily completed the year's internship may apply for continuing assignment with the Service. They are eligible to take the examination for appointment in the Regular Corps.

In addition to internships, Public Health Service hospitals offer approved residency training in the following specialties: surgery, general practice, internal medicine, orthopedics, urology, anesthesiology, dermatology and syphilology, ophthalmology and otolaryngology, pathology, radiology, and psychiatry. The National Institutes of Health Clinical Center, 500-bed research hospital at Bethesda, Md., offers residency training in internal medicine, neurology, ophthalmology, pathology, psychiatry, and radiology. Residents are usually selected from the Commissioned Corps.

Through the Commissioned Officer Residency Deferment (CORD) program, Public Health Service offers qualified physicians the opportunity to obtain deferment from military service under the Universal Military Training and Service Act. Physicians are commissioned in the Reserve Corps of Public Health Service and deferred from active duty to obtain residency training in essential specialty fields. After completion of training, participants must serve their obligatory time with Public Health Service. No additional military service is required.

The program known as COSTEP provides employment for a limited number of medical and dental students during the vacation months for duty at Public Health Service hospitals, research laboratories, and other facilities. Appointments are offered to students who will have completed their sophomore year of professional education by July 1 and are interested in becoming reserve officers in the Commissioned Corps.

Inquiries concerning employment in the Public Health Service may be obtained from the Surgeon General, United States Public Health Service (P), Washington 25, D. C.

Conferences and Seminars

To encourage early and adequate exchange of information among investigators, numerous conferences, seminars, and symposiums are supported in connection with the grants and training programs. Many of the meetings are initiated and sponsored by the advisory study sections of the Division of Research Grants.

In addition, the institutes, separately or as a whole, present lectures, seminars, and clinical conferences. Frequently there is active participation by

faculty members of universities and medical schools, staffs of other research centers and Public Health Service hospitals, physicians in private practice, and other leaders in the medical sciences.

Research workers met at a conference held in 1957 under the auspices of the Surgery Study Section to discuss developmental, technical, and clinical problems in extracorporeal circulation. The Sensory Diseases Study Section, in hopes of stimulating interest among young investigators, assembled experts in retinal physiology, biochemistry, optical physics, and psychology to discuss the present status of knowledge of visual mechanisms within the eye and brain.

The Radiation Study Section sponsored a series of conferences in 1957 and 1958 to facilitate the application of radiobiological knowledge to the treatment of cancer. Work conferences on research training for nurses and on special clinical training in cardiovascular nursing were inaugurated by the Nursing Research Study Section in 1958. The Biophysics and Biophysical Chemistry Study Section sponsored regional conferences in 1956 and 1957 to help determine how best to provide training and develop research in the theory and practice of medical-science instrumentation, and in 1958 the Section held two conferences to explore research and training opportunities for scientists and mathematicians in the new field of physical biology.

A postgraduate course on research in cardiovascular disease was given by National Institutes of Health for the American College of Physicians in the fall of 1957, and other courses for the College are planned. Meetings such as those supported by the National Institute of Mental Health provide orientation and training in specific services—the annual conferences, for example, on the reporting of mental hospital statistics. The National Institutes of Health also provides personnel and exhibits for medical and scientific meetings of state, regional, national, and international scope.

THE NATIONAL SCIENCE FOUNDATION

The following résumé of the activities of the National Science Foundation, in so far as they are related to medicine through grants for basic research in the medical sciences, grants for short-term medical research, and fellowships for study at the graduate and postdoctoral level, has been submitted by the Public Information Office of the Foundation.

The National Science Foundation, an agency of the federal government, was established by Congress in 1950 "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense; and for other purposes." The foundation carries out its mission by supporting basic research in the sciences, programs for improving science education, conferences and symposia on specific aspects of science, studies of manpower supply and demand, programs for making scientific information more readily available, and the compilation of data on the national effort in scientific research and development.

Of particular interest to the medical profession are the foundation's grants for basic research in the medical sciences, grants for short-term medical research, and fellowships for study at the graduate and postdoctoral level (table 54).

Basic Research

Grants are made to help competent scientists conduct basic research in the sciences, principally at universities and colleges. Normally, proposals are originated by the scientist and are endorsed and submitted by his institution. Basic Research is supported in the mathematical, physical, medical, biological, engineering and other sciences, including to a limited extent, the social sciences. In 1957, the Congressional appropriation to the foundation for the support of basic research was $15,500,000. Approximately $7,360,000 was expended in support of the life sciences. In 1958, the appropriation for the support of basic research was $19,400,000, with approximately $8,000,000 for the life sciences.

TABLE 54.—*NSF Support of Activities (Research and Conferences) of Interest to Medical Profession*

	Fiscal Year 1957		Fiscal Year 1958	
	Number	Amount	Number	Amount
Basic medical research grants	22	$467,200	24	$550,600
Short-term research by medical students	16	194,400	17	193,300
Conferences and symposia on subjects of medical interest	3	18,000	1	20,000

Short-Term Medical Research

In an effort to increase the number of scientists qualified to perform basic research in medical fields, the foundation sponsors a program designed to encourage medical school students to pursue careers in research.

Medical school students constitute one of the largest sources, relatively untapped, of medical research scientists. The medical curriculum is essentially instructional, offering little, if any, opportunity for students to pursue research and become familiar with its methods or challenges. The foundation seeks to introduce medical students to the techniques of basic research by means of its grants to medical schools for the support of short-term research by students during free-quarter periods. Without interfering with the medical curriculum, the program provides opportunities for carefully selected students to determine their interest in and aptitude for research. Student research is conducted under the supervision of qualified members of the medical school staff.

In 1956, the foundation began this program experimentally. In the three years of its operation, the program has expanded considerably and now includes 34 medical schools in the nation. A total of $467,250 has been granted for this purpose.

Conferences and Symposia

The conferences and symposia supported by the foundation provide excellent opportunity for the interchange of information and ideas among experienced investigators, as well as an opportunity for younger investigators to meet and obtain information and advice from some of the world's foremost scientists. Approximately 25 such conferences are supported each year. In 1957 there were three such conferences of special interest to those in the medical profession and in 1958, one (table 54).

Additional information on the support of research grants in the medical sciences may be obtained from the Division of Biological and Medical Sciences, National Science Foundation, Washington 25, D. C.

Fellowships

The Fellowship Program of the foundation is designed to strengthen the nation's potential by providing support for advanced training in the sciences directed toward the development of highly qualified research scientists and for further study in the sciences directed toward increasing the competence of college science teachers.

Fellowships are offered for graduate study in the physical, medical, biological, and engineering sciences; anthropology and psychology (excluding clinical); and geography, certain interdisciplinary fields, and selected social science fields. These fellowships are limited by law to citizens of the United States. A Fellow may study under his award at any accredited nonprofit institution of higher education in the United States or any similar institution abroad approved by the National Science Foundation.

Awards are *not* made to individuals to pursue a course of study designed to prepare them for careers in medical practice or other clinical fields; applications are accepted, however, from students who intend to obtain advanced training in one of the medical sciences directed toward a career in research. An individual who holds a degree such as M.D., D.D.S., or D.V.M. and desires to continue training for a career in research is eligible to apply for a postdoctoral award provided he can present an acceptable plan for study and research.

Four types of fellowships are offered—the Predoctoral, Regular Postdoctoral, Senior Postdoctoral and Science Faculty. The predoctoral program is open to students studying for masters or doctoral degrees in science. The three predoctoral levels, first-year, intermediate-year, and terminal year, carry base stipends of $1,600, $1,800, and $2,000, respectively, with allowances for travel and dependents. Approximately 1,000 predoctoral fellowships were awarded during 1958.

The regular postdoctoral program is available to those who have earned a doctoral degree or have had research training and experience equivalent to that represented by such a degree. The stipend is $3,800 with allowances for travel and dependents. These awards are made semiannually, and approximately 125 were made in 1958.

The objective of the senior postdoctoral program is to provide senior, established scientists an opportunity to increase their competence as investigators in their own or related fields. These scientists should have held their doctoral degree for a minimum of five years. A salary-matching stipend is awarded, up to a maximum of $12,000. Approximately 75 such fellowships are awarded each year.

To increase the effectiveness of the teaching of college science teachers, the foundation awards annually science faculty fellowships to teachers with three years college teaching experience and plan to continue teaching. A salary-matching stipend is given, up to a maximum of $12,000. Approximately 180 such fellowships were awarded in 1958.

During fiscal year 1957, 34 fellowships were awarded in the medical sciences. There were 20 predoctoral, 9 regular postdoctoral, 2 senior postdoctoral, and 3 science faculty fellowships. During fiscal year 1958, 41 fellowships were awarded in the medical sciences—15 predoctoral, 18 regular postdoctoral, 5 senior postdoctoral, and 2 science faculty.

Additional information on the Predoctoral and Regular Postdoctoral Fellowship Programs of the National Science Foundation may be obtained from the Fellowship Office, National Academy of Science-National Research Council, Washington 25, D. C.

Additional information on the Senior Postdoctoral and Science Faculty Fellowship Programs may be obtained from the Division of Scientific Personnel and Education, National Science Foundation, Washington 25, D. C.

CONTRIBUTIONS OF THE OFFICE OF VOCATIONAL REHABILITATION TO MEDICAL EDUCATION AND RESEARCH

Since 1954 the Office of Vocational Rehabilitation, under authority of the Vocational Rehabilitation Act, has offered direct and indirect aid of five types to medical education and research. The following summary of the various grant programs administered by the Office of Vocational Rehabilitation which have an impact on medical education has been prepared by its administrative staff for the education number of THE JOURNAL.

The Office of Vocational Rehabilitation, Department of Health, Education, and Welfare, offers direct and indirect aid to medical education. Direct aid is available in the form of long-term teaching grants and short-term course or institute grants to the schools. Less direct but significant support is provided through research grants, research fellowships, and traineeships. These five types of aid,

made possible under authority of the Vocational Rehabilitation Act of 1954, may be summarized as follows:

1. Teaching grants for long-term training assist the schools in initiating, expanding, or improving teaching in the rehabilitation phases of medicine. The number of medical schools receiving teaching grants has increased from 6 in 1956 to 25 during the current academic year. Averaging from $15,000 to $25,000, the grants are intended to provide part of the costs of the teaching program. Generally, they cover the salary of a faculty member coordinating the program, payment for the part-time services of supporting staff, and the purchase of instructional equipment or materials. The duration of these grants is one academic year with provision for reapplication by the institution for continued support.

2. Short-term course grants are made to medical institutions to stimulate interest and to increase knowledge regarding the potentialities of rehabilitation. Funds from this source may also be used to pay part of the costs incurred by those in attendance. During the past year, specialized courses were conducted in geriatric rehabilitation, the teaching of esophageal speech, and administrative problems encumbered by physicians engaged as medical consultants in the state-federal vocational rehabilitation program. Short-term courses dealing with prosthetic rehabilitation of the upper extremity amputee and the above-knee amputee reached in 1957 an estimated 600 physicians, physical therapists, occupational therapists, and prosthetists.

3. Traineeship grants in medicine serve the purpose of increasing the nation's supply of qualified physiatrists. They were given during the past academic year to 25 institutions offering approved residency programs in physical medicine. From this source the institutions, in turn, awarded traineeships to individual physicians. The number of physicians receiving this type of support has increased from 4 in 1955 to 139 during the past academic year. Expenditures for such traineeships, which averaged $6,000 per trainee, increased from $287,500 in 1956 to $650,000 in 1958.

Office of Vocational Rehabilitation funds have also been used in several institutions to establish part-time courses in rehabilitation methods and concepts for graduate physicians engaged in residencies in neurology, neurosurgery, orthopedics, psychiatry, urology, plastic surgery, etc.

4. Research and demonstration grants are available for the partial support of projects aimed at developing more effective methods and techniques for the vocational rehabilitation of the more severely disabled. Although no specific matching is required, sponsors of current active projects are carrying an average of 33% of the total cost of the projects. Research and demonstration grants are recommended for approval by the National Advisory Council on Vocational Rehabilitation which is composed of medical, educational, and scientific members who are established authorities in fields concerned with vocational rehabilitation.

Projects are being encouraged in the following categories: (*a*) studies designed to determine physiological changes which occur during treatment and retraining in physical rehabilitation; (*b*) the development of new and improved diagnostic techniques; (*c*) investigations to elucidate the dynamics of individual and group motivation as a factor in success or failure of physical medicine procedures; and (*d*) projects for developing quantitative methods for evaluating functional capacities of disabled individuals.

5. Research fellowships may be awarded to assist qualified candidates to pursue advanced training for research in rehabilitation or to undertake a research project which holds promise of advancing knowledge of the vocational rehabilitation of disabled persons. Three types of fellowship are available: predoctoral, postdoctoral, and special. The awards are made on an annual basis and are subject to a limitation of two years.

The programs of the Office of Vocational Rehabilitation in aid to medical education are based on long-standing practices of cooperation with state and local agencies and medical institutions. National advisory committees play a major role in the administration of the office's educational grants program. These committees, composed of leaders in the educational, research, and administrative phases of the various rehabilitation disciplines, have helped to formulate the policies and basic principles which govern the grant programs for medical education. Academic freedom for the institutions and individuals receiving grants is a primary consideration. The intent of Congress, the recommendations of the advisory committees, and the traditions and experience of the Office of Vocational Rehabilitation provide maximum safeguards for that freedom. In carrying out the over-all program, every effort is made to insure the widest distribution of funds, taking into consideration the number and quality of the projects and the available resources.

UNDERGRADUATE AND GRADUATE MEDICAL TRAINING PROGRAMS IN THE VETERANS ADMINISTRATION

The following material reviewing the Undergraduate and Graduate Medical Training Programs in the Veterans Administration has been submitted by the Director, Education Service, Research and Education, Department of Medicine and Surgery of the Veterans Administration.

The Veterans Administration medical school relationship which resulted from the 1946 congressional action organizing a Department of Medicine

and Surgery within the Veterans Administration had as its principal purpose the organization and supervision of graduate training programs in Veterans Administration hospitals by medical school faculties. This relationship was formalized by a policy memorandum issued Jan. 30, 1946, and at that time undergraduate medical education was not considered in establishing the Veterans Administration medical school relationship.

On Nov. 21, 1957, nearly 12 years after the inauguration of this relationship, a letter survey was made of all Veterans Administration hospital managers and all deans of associated medical schools asking for a reevaluation of the Veterans Administration medical school relationship. The results of this survey will be reported in another publication at a future date, but the significant feature of the replies was a unanimous endorsement and recommendation for continuing the relationship. This relationship has endured for 12 years because it is mutually beneficial to both the medical schools and the veterans hospital.

TABLE 55.—*Veterans Administration Residents, April, 1958*

	Career Residents	All Other Residents	Total Residents
Allergy	0	4	4
Anesthesiology	11	67	78
Cardiology	0	8	8
Dermatology	0	30	30
Gastroenterology	0	5	5
General surgery	0	606	606
Internal medicine	0	644	644
Neurology	17	18	35
Neurosurgery	0	34	34
Ophthalmology	0	63	63
Orthopedic surgery	0	111	111
Otolaryngology	0	29	29
Pathology	7	82	89
Physical medicine	23	7	30
Plastic surgery	0	11	11
Psychiatry	184	186	370
Pulmonary diseases	0	13	13
Radiology	20	133	153
Thoracic surgery	0	26	26
Urology	0	86	86
Totals	262	2,253	2,515

UNDERGRADUATE MEDICAL EDUCATION

For the academic year 1957-1958, 62 medical schools assigned 6,022 medical students to Veterans Administration hospitals of which 4,917 (82%) were third and fourth year clinical clerks. Many others assigned students on other than clerkship basis. Eighteen Veterans Administration hospitals received 100% of the third year medical school class and 16 hospitals received 100% of the fourth year medical school class for clerkship training.

GRADUATE TRAINING PROGRAMS

Table 55 indicates that residency training is conducted in 20 medical specialties in Veterans Administration hospitals. As of April 15, 1958, there were 2,515 residents on duty of which 262 were "career residents" receiving the pay of full-time physicians in return for a contractual obligation to serve specified periods of obligated service at the conclusion of their formal residency training.

While all authorized residency positions are filled, the facilities of Veterans Administration hospitals would permit significantly greater numbers of residents to be trained provided both funds and resident candidates were available. The actual capacity of Veterans Administration hospitals engaged in residency training is 3,806, although this number of positions has never been offered at any time.

The 2,515 residents on duty in Veterans Administration hospitals represent 82% of all reported residency appointments in the federal services and represents 11% of all residency appointments throughout the United States.

Veterans Administration hospitals participate in 626 different individual residency programs. Of these, 29% are conducted as integrated programs by combination with university programs in the community. They are, therefore, not independently approved and are usually listed in THE JOURNAL of the American Medical Association under an "indented" heading. Three hundred and eight (49%) are independently approved in the name of the Veterans Administration but are conducted in collaboration with other approved programs. Sixty-two (10%) are conducted on an affiliate basis with approval for such programs resting in the name of another hospital than the Veterans Administration. Forty-seven (7%) are independently approved and conducted without any outside collaboration or affiliation, while 42 (5%) of the programs are now pending approval.

FOREIGN MEDICAL SCHOOL GRADUATES

During the past fiscal year, 168 residents were graduates of foreign medical schools, and 16 of the total were graduates of Canadian medical schools. In addition to the above United States citizens who were graduates of foreign schools, 89 noncitizen residents were serving on a "without compensation" basis by assignment from university hospitals. Twenty-six noncitizens were assigned with Veterans Administration hospitals having residency training programs on a "guest student" basis to act as observers only and not to participate in residency training programs from the standpoint of assuming responsibility for patient care.

Recognition of the approved status of Canadian medical schools finds expression in a relaxation of the previous requirements for citizenship. At present, a noncitizen who is a graduate of an approved Canadian or American medical school may be employed as a resident in Veterans Administration hospitals. United States citizens who are graduates

of other foreign medical schools may not be employed unless holding certification from the Educational Council on Foreign Medical Graduates, Inc.

RESIDENT COMPENSATION

Subsequent to congressional action improving the pay status of federal employees, the maximum stipend for residents was increased on July 1, 1958. Board, room, and laundry cannot be provided free to residents, and therefore these costs must be deducted from the resident's stipend if provided by the Veterans Administration hospital. Table 56 reveals the current maximum stipends for medical residents. Each deans committee determines the actual stipend level within the permissible maximum.

NATIONAL DEFENSE AND MEDICAL EDUCATION

SELECTIVE SERVICE SYSTEM

The following information, current as of July 1, 1958, has been submitted by the Selective Service System National Headquarters.

The responsibility for primary classification of registrants rests with Selective Service local boards. If a person or his employer (college, medical school, or hospital) has requested his deferment and he has been classified as available for military service, the person or his employer may, within 10 days of the mailing of the notice of classification, file an appeal. The appeal will be reviewed ordinarily by the appeal board having jurisdiction where the registrant's local board is located, but it may be transferred for review to the appeal board having jurisdiction in the area where the registrant is working or attending college if this is requested in writing when the appeal is made. If the state appeal board should sustain the classification, the registrant or his employer may, if there is a dissenting vote in the appeal board, file a written request with the local board to have the decision appealed to the President. If there is no dissenting vote, the state or national director of Selective Service may appeal the case to the president.

The "college student certificate," SSS Form 109, continues to be prescribed for the use of institutions of higher learning, including those of medicine, in furnishing the local boards information regarding registrants who are enrolled as students in those institutions. These forms should be submitted to the local boards by the educational institution on request of the registrant. However, the mere filing of such a form does not constitute a request for occupational deferment, since, in order to establish the right of appeal as an interested party, a written request from the college or employer for occupational deferment must accompany the form. The registrant has the right of appeal if exercised in the prescribed 10 days. He may make his appeal informally in writing.

Eligibility for Consideration for Deferment

The law empowers the President to provide for the deferment of any person whose deferment is equitable and in the national interest. Furthermore, it is the sense of Congress that provision should be made for the annual deferment from training and service of premedical, predental, and allied preprofessional students in numbers equal to those at present (1950) in attendance at colleges and universities as outlined in the general student deferment program.

Sections 1622:15 and 1622:25 of the Selective Service Regulations specify the conditions under which students pursuing programs of higher education may be considered for deferment. Within these specified requirements, students of the healing arts are considered for deferment in the same manner as students pursuing other undergraduate or graduate courses at colleges, universities, and similar schools.

Any student not previously deferred who is pursuing a full-time course of study is entitled to a single period of statutory deferment, class 1-S, until the end of the academic year. Such deferment does not preclude the possibility of later deferment in class 2-S. Students whose activity in study, research, medical, or other endeavors is found necessary to maintenance of the national health, safety, or interest may be deferred in class 2-S until completion of their college training, provided they maintain satisfactory scholastic records. A student who is deferred for study extends his liability for military training and service up to his 35th birthday instead of his 26th, as prescribed for registrants who have never enjoyed a deferment.

TABLE 56.—*Resident Stipends (Maximum)*

	Per Year
Junior resident	$3,250
Intermediate resident	3,515
Senior resident (first year)	4,165
Senior resident (second year)	4,945
Senior resident (third year)	5,545

In selecting a student for deferment in class 2-S, the Selective Service local boards may, at their discretion, be guided either by the score made by the student on the Selective Service College Qualification Test or by his record of academic performance. The college qualification test is given for the Selective Service System by the Science Research Associates, Inc., of Chicago. At present, in order to be eligible for deferment on the basis of this test, an undergraduate student must make a score of 70 or more. SSS Form 108 has been prescribed for furnishing to the local board the score made on this test. This score is confidential and may be divulged by the local board only to the registrant or to one holding his written consent.

To qualify for deferment on the basis of academic performance, the nonprofessional student must have maintained the following standing among the male members of his class: freshman year, upper one-half; sophomore year, upper two-thirds; and junior year, upper three-fourths. A student accepted for admission to medical school after July 1, 1951, for the class next commencing may be deferred, provided that, during his last full-time year at college or university, he was ranked among the upper one-half of the male members of his class or had a score of 70 or more on the Selective Service College Qualification Test.

A student accepted for admission by a graduate school after July 1, 1951, as a full-time student for the class next commencing may be deferred provided that, in his last full-time academic year in a college or university, he achieved a scholarship standing among the upper one-fourth of the male members of his class or scored 80 or more on the qualification test and provided that the graduate school certifies that he is meeting the degree requirements. Decisions concerning deferment of American students enrolled in foreign universities, including medical students, are the responsibility of the local boards. The local board may accept or reject any claims or evidence presented for deferment.

Status of Interns and Residents

The Selective Service System has always recommended the deferment of graduates of medicine to complete one year of internship training. Selective Service has stated that men, to be given favorable consideration for deferment to complete a residency or more than one year of internship, should be absolutely essential to the operation or maintenance of the hospitals where they are employed or that they be among those selected by the surgeon general of the United States Public Health Service and recommended for specialty training necessary in the staffing of the hospitals of the United States Public Health Service. The Selective Service System is of the opinion that there is a sufficient number of young physicians who have satisfied their military liability or who are physically disqualified for military service to satisfy the requirements of the hospitals for residents and to provide for specialty training for civilian needs.

The Selective Service has agreed to recommend to the Selective Service local boards the deferment of men in a number not to exceed 300 as an overall total for the surgeon general of the United States Public Health Service. It is expected that this program may be continued from year to year.

All young physicians participating in this program are to be commissioned in the reserve component of the Public Health Service, and they are to be selected by the surgeon general of the Public Health Service for such training. The request for deferment is to pass from the individual to the surgeon general of the Public Health Service and then, if recommended, will be forwarded through national headquarters of the Selective Service System to the respective local boards of that system.

Those graduates of medicine who accept a commission in the medical corps reserve of an armed force will not be used, according to present Selective Service policy, to fill a regular call; therefore, such young men who are accepted in the Berry Plan and who accept reserve commissions will be classified by their Selective Service local boards in a class indicating that they are members of the reserve forces. Should it become necessary for the Department of Defense to place with Selective Service a special call for doctors of medicine, such men will then be given consideration for deferment from active duty for such period of time necessary to complete their training.

A young physician who has established himself in a community where he has been found by his local board essential to the maintenance of an adequate medical service in that community may be deferred by his Selective Service local board or such a physician may be deferred for teaching, research, or Public Health work when these are considered by the local board to be essential in the national interest.

For the academic year 1958-1959, the Public Health Service has arranged certain research grants for students who have completed two years in medicine. These grants will be for one year, and the deferment of these special men will be requested by the individual registrant and recommended by the surgeon general, United States Public Health Service.

Status of Faculty Members

No policy has been announced by the Selective Service System on the granting of deferment to faculty members, except that teachers of medicine have been mentioned in a Selective Service Operations Bulletin as being in a critical occupation to which local boards should give special consideration. It has been recommended that as a general policy, essential members of the medical, dental, and veterinary faculties be held in their teaching positions until such time as replacements are found. This recommendation applies especially to persons in the basic science departments. This policy is not a blanket recommendation for deferment from military service for all teachers. Part-time teachers, who devote only a small portion of their time to teaching, will be expected to enter the military services. The President is also directed to establish a national advisory committee to advise the Selective Service System and to assist state and local advisory boards in selecting the needed medical, dental and allied personnel.

Expiration of the "Doctor-Draft" Law

The August, 1957, issue (vol. 7, no. 8) of Selective Service carried a statement regarding the expiration of the "Doctor-Draft" law and the new legislative provisions for "Specialists' Service." Because of its importance from the standpoint of medical education as well as its implication in medical practice, this statement is presented in full in the following paragraphs.

"Doctor-Draft" Law Expires; New Legislation Provides for Specialists' Service

Amendments to the Universal Military Training and Service Act, as amended, adopted in June, 1957, replace the former "Doctor-Draft" law and provide for meeting the requirements of the Armed Forces for medical, dental, and allied specialists until June 1, 1959. Under the new amendments only those specialists who are otherwise liable as regular registrants are subject to induction under the Selective Service Law.

The old "Doctor-Draft" law under which medical, dental and allied specialists had been liable since 1950 expired July 1, 1957. It had placed liability for service on older doctors, dentists, and allied specialists, at one time up to the age of 51.

One of the principal effects of the new amendments to the basic Selective Service Law is to limit liability of doctors, dentists and allied specialists to age 35 for those deferred on or after June 19, 1951, and to age 26 for others. Public Law 85-62, which amends the basic Selective Service Law with respect to these specialists, was signed by the President on June 27, 1957. By placing medical, dental, and allied specialists under the same provisions of law and regulations as other registrants with respect to the upper limit of the age of liability, the 1957 amendments relieve from liability under the Universal Military Training and Service Act, as amended, any such specialist over the age of 32 on the date the amendments became effective—July 1, 1957. This is true because in order to have acquired extended liability under the June 19, 1951, amendments, a registrant must not only have been deferred on or after that date, but also must not have attained the 26th anniversary of his birth by that date. Any man who was 26 on June 19, 1951, would, on July 1, 1957, have been 32 years old.

The amendments in addition provide that

1. No person in the medical, dental, and allied specialist categories shall be inducted if he applies for an appointment as a reserve officer and is or has been rejected for such an appointment on the sole ground of physical disqualification.

2. The President may order to active duty for not more than 24 consecutive months any member of a reserve component who is such a specialist, who is under 35, and who has not performed at least one year of active duty in the armed forces.

3. Any such person called or ordered to active duty from a reserve component of the armed forces and who serves on active duty as a specialist for 12 months or more, shall upon release from active duty or within six months be given an opportunity to resign the commission unless he is otherwise obligated to serve in active training and service in the armed forces or in training in a reserve component by law or contract.

4. Any physician or dentist qualified for a reserve commission shall, so long as need for his services exists, be given an opportunity to volunteer for active duty of not less than 24 months.

5. The President may prescribe rules and regulations for the selection or induction of persons by age group or groups and for the selection and induction of persons qualified in needed medical, dental, or allied specialist categories pursuant to requisitions submitted by the Secretary of Defense.

6. Qualified specialist aliens liable for induction shall not be held ineligible for appointment as commissioned officers solely on the grounds that such alien specialists are not citizens or have not declared their intention of becoming citizens.

7. Any qualified person who is liable for induction, or who is ordered to active duty as a member of a reserve component as a physician, or a dentist, or in an allied specialist category, shall be appointed, reappointed, or promoted to such grade or rank as may be commensurate with his professional education, experience, or ability provided that any person in a needed medical, dental, or allied specialist category who fails to qualify for, or who does not accept, a commission, or whose commission has been terminated, may be used in his professional capacity in an enlisted grade.

8. Periods of active duty performed by such specialists in student programs prior to receipt of appropriate professional degree or in intern training shall not be counted toward establishing the qualification of such specialists for classification as a veteran exempt from liability for training and service.

9. It is the sense of Congress that the President provide for deferment of optometry students and premedical, preosteopathic, preveterinary, preoptometry and, predental students in numbers at least equal to the numbers of such male students now studying in colleges and universities.

10. Public Law 62, 85th Congress, amending the Universal Military Training and Service Act, as amended, to provide service liability for persons in medical, dental and allied specialist categories, expires on July 1, 1959.

With the expiration of the requirement for special registration of medical, dental, and allied specialists, such specialists under the amendments of June 27, 1957, should notify their local boards within 10 days of the attainment of degrees in these fields.

ARMY, NAVY, AND AIR FORCE PROCUREMENT PROGRAMS

The following information summarizing the Army, Navy, and Air Force procurement programs has been submitted by the office of the Assistant Secretary of Defense (Health and Medical), current to June 26, 1958. It has been prepared so as to present a general portrayal of current procurement programs in the medical branches of the armed services insofar as they concern undergraduate and graduate medical education.

Army

EARLY COMMISSIONING PROGRAM FOR MEDICAL STUDENTS

Medical students may apply for commissions in the grade of second lieutenant, Medical Service Corps, Army Reserve, while attending medical school. Students participating in this program will be obligated to accept superseding appointments in the grade of first lieutenant, Medical Corps, Army Reserve, upon graduation and, in accordance with the needs of the active Army may be required to serve on active duty for a period of two years upon completion of internship. Persons appointed under this program are assigned to Ready Reserve Units in appropriate medical corps vacancies in TOE and TD troop program units, USAR Schools, and USAR Control Groups (Annual Training).

Every effort will be made to place officers commissioned under this program on active duty on a date desired by them; however, no assurance can be given that they will be ordered to active duty at a particular time, since such action is contingent upon programmed requirements of the active Army.

Participation in this program will not in itself increase the active service liability or obligation of the participant. However, participants will be required to certify to their understanding that appointment prior to attaining age 26 incurs an obligation for active participation in the Reserve training unless excused under regulations prescribed by the Secretary of the Army.

Clinical Clerkship Training Program

Participants in the Clinical Clerkship Training Program will be medical students at the sophomore-junior and/or junior-senior level, who now hold appointments in the Medical Service Corps, Army Reserve, as lieutenants, or will be commissioned in sufficient time to participate in the program. A limited number may also participate in the program as "student employees" under Civil Service. Students in Army Reserve status who are selected for this clinical clerkship must volunteer to perform not more than 60 days of active duty for training, including travel. Students who are assigned to a USAR Control Group (annual training) and are selected for the clerkship will fulfill their annual requirement for active Reserve participation by performing the above period of active duty for training. The students who are assigned to a TOE or TD Reserve Unit, or a USAR School, will perform this training "in lieu of" the annual unit training (summer camp) requirement with their unit.

The program will consist of approximately eight weeks of instruction at Army teaching hospitals, which will be devoted to military medicine and other military instruction, and the remaining time will be divided into two equal periods, one embracing internal medicine and its subspecialties, the other surgery and its subspecialties. A preventive medicine program will also be available and will include one week of general orientation in military organizaations, its functions and procedures, followed by detailed observation and assistance in a comprehensive preventive medicine program. Research clerkships are also available in a limited number for selected individuals at Walter Reed Army Institute of Research.

The program commences on July 1 each year and is of 45-60 days duration. A student selected for a clerkship between his sophomore-junior year is not eligible to apply for the clerkship between his junior-senior year.

Senior Medical Student Program

Selected senior medical students will be commissioned as second lieutenants, Medical Service Corps, United States Army Reserve, and will be permitted to continue their studies in their respective schools as officers on active duty with full pay and allowances until they complete their academic requirements for the degree of doctor of medicine. Upon completion of their medical education, selected students will be required to accept appointments in the grade of first lieutenant, Medical Corps, U. S. Army Reserve; they must agree to participate in the National Intern Matching Program, Incorporated, and serve on active duty for three years immediately following their civilian or military internship. This includes time obligated under the Universal Military Training and Service Act, if applicable. Participants who are not matched for an Army internship will be released from active duty for one year to allow them to complete a civilian internship, and they will then be recalled to active duty for three years at the end of the 12-month period.

Military Intern Program

Selected graduates of approved medical schools will be commissioned as first lieutenants, Medical Corps, U. S. Army Reserve, and will be ordered to active duty for the purpose of completing a 12-month internship in a military hospital. Individuals participating in the program will not incur obligatory service; however, those individuals who will be liable for military service under the provision

of any law will be required to serve that obligation immediately upon completion of their internships. Military interns will be encouraged to apply for Regular Army and residency training.

Applicants must agree to participate in the official cooperative plan of internship appointments for first-year internships as conducted by the National Intern Matching Program, Incorporated.

Military Resident Program

The Military Resident Training Program is established for the purpose of providing the number of specialists required to meet the needs of the Army for career Medical Corps officers. Residencies are sponsored in both military and civilian hospitals.

Officers of the Regular Army Medical Corps and individuals who meet the appointment criteria for the Regular Army are eligible to compete for residency training. Although appointment in the Regular Army is not a requirement for appointment as a resident, the purpose of the program is to provide the Army with sufficient career personnel having the required specialty training. Accordingly, applicants will be considered on the following priority basis: (1) Regular Army Medical Corps officers, (2) Reserve Medical Corps officers on active duty, including interns who are concurrently applying for Regular Army appointment, (3) civilian physicians, including interns, who apply for Regular Army appointment, and (4) all other applicants.

Inasmuch as the number of applications received for participation in the Army residency program far exceeds the number of appointments available, consideration should be given to seeking a Regular Army commission in order to establish a priority for consideration for the residency program. Appointment for the program ordinarily will not be made more than two years in advance, and applications for Regular Army in connection with residency training will not be considered for appointment in a grade higher than captain. Individuals selected for training who have not completed the appropriate Army Medical Service orientation course, or an equivalent period of active duty as a medical officer, as determined by the surgeon general in each case, will be required to undergo such training prior to entering residencies. Selections will be made in November of each year. Appointments to fill remaining vacancies will be made from applications as received. Training in most specialties commences approximately every six months.

Individuals placed in residencies in Army hospitals will be required to serve one year on a duty status for each year of training received.

In the event spaces in the specialty requested are not available in Army hospitals on one of the next two or three starting dates after approval of an application, an opportunity will be offered to applicants approved for Regular Army to obtain residency training in a civilian hospital approved by the Council on Medical Education and Hospitals of the American Medical Association. Individuals participating in the program in civilian hospitals under this policy are required to serve on active duty for two years for the first year of training received and one year for each subsequent year.

Navy

THE ENSIGN 1915 USNR PROGRAM

After passage of the Selective Service Act of 1940, many medical students who were obligated for military service by the Act indicated their desire to affiliate with the Naval Reserve in order to assure that their period of active duty would be with the Navy's Medical Department. To make this possible and to provide deferment from active duty until graduation, the Ensign, Probationary (Medical) Program was established before the onset of World War II. The first appointments late in 1941 were limited to third-and-fourth-year medical students attending class "A" (approved) medical schools. Within a few months, however, the program was expanded to include first-year and second-year medical students, and it has since come to be known as the Ensign 1915 Program.

The number "1915" is a designator used to identify officers within the Department of the Navy by a code system. The first two digits, 19, indicate that the officer is under instruction in a civilian school; the last two digits, 15, indicate an officer of the Naval Reserve.

The qualifications for appointment as Ensign, 1915, are as follows:

A. Sex: Men and Women

B. Age

(1) Candidates with no prior military service should be at least 19 and of such age that upon expected date of graduation, they will be under 33. The maximum age limit with prior active military service may be adjusted on a month-for-month basis, depending upon the number of months of active military service performed, but in no case to exceed 36 months. Applications cannot be accepted from any person who will have passed his or her 36th birthday when he or she becomes eligible for superseding appointment in the Medical Corps, U. S. Naval Reserve following graduation from medical school.

C. Educational

(1) Should be within 120 days of completion of all academic work required for enrollment in medical school.

(2) Should be in attendance or have been accepted for and be within six months or less of the date of the next entering class at one of the American or certain of the Canadian medical schools accredited by the Council on Medical Education and Hospitals of the American Medical Associa-

tion, including approved schools of the basic medical sciences in the United States and Canada. Applications cannot be accepted from students who will attend a medical school in a foreign country other than Canada.

(3) Should NOT have commenced the final year of medical school.

D. Professional

(1) Applicants are required to establish professional fitness and aptitude for the Naval Service through interviews and a review of college and employment records.

E. Physical Standards

(1) Should be found physically qualified for appointment to commissioned status in accordance with established regulations.

The primary objectives of this program are to provide (1) an opportunity for qualified medical students to affiliate with the Naval Reserve as commissioned officers while still in medical school; (2) assurance that these officers will be able to complete their medical studies and internship prior to fulfilling their obligation for active military duty; (3) assurance that, when they do enter the service, it will be within the Navy's Medical Department; and (4) a primary source of qualified candidates for the Naval Intern Program and for the Medical Corps of the Navy and Naval Reserve.

As an added incentive for membership in the Ensign, 1915 Program, there has been established a 30-60 day active duty research clerkship training program at naval research activities throughout the United States. This program provides orientation and indoctrination into medical research as well as on-the-job training for the undergraduate medical student during his vacation from medical school. Full pay and allowances are authorized for these selected officers while so serving on active duty. Medical students who are commissioned as Ensign, 1915 USNR, and who have successfully completed the first year of medical school are eligible to participate in this program. Research clerkships offer a detailed review of the specific research program being conducted at the training activity. A part of the training is spent in each research department and the trainee serves as an assistant in actual laboratory research on a specific project under way at that time.

Also established are clinical clerkships at Naval teaching hospitals throughout the United States. Beginning July 1 of each year, this program offers quotas for selected medical students who have completed the second year of medical school, 30 to 60 days of active duty for training during vacation from medical school. Clinical clerkships are planned to provide indoctrination and orientation into naval medicine, rotation through the major professional services of a naval teaching hospital, and performance of on-the-job training duties commensurate with the individual's professional attainments.

Normally each year during the summer months a limited number of mature medical students holding commission as Ensign, 1915, are authorized to participate in NROTC-Midshipmen Cruises. Selections for this important training are made from students who have completed at least their second year of medical school with priority being given those who have completed their third year. Trainees receive an excellent indoctrination and orientation into the practices of naval medicine aboard ship under the supervision of experienced medical officers of the Regular Navy and Naval Reserve.

To assist the medical student financially, and to attract future doctors of medicine toward a career in the Navy Medical Corps, the Senior Medical Student Program was authorized by the Secretary of the Navy. To be eligible for participation, the individual student must be an Ensign, 1915 USNR, or agree to accept such an appointment if selected. Further, he must have completed his third year of medical school and be eligible for enrollment in the ensuing year. During attendance in medical school, these officers serve on active duty, receiving the full pay and allowances of their rank. In return for participation in this program, the individual serves one year plus the 24 months obligated by the Universal Military Training and Service Act, as amended.

Here are some important facts concerning the Senior Medical Student Program:

(1) This program is open to qualified students enrolled at medical schools accredited by the Council on Medical Education and Hospitals of the American Medical Association. Students who have completed their second year of medical school may make application for this training at an Office of Naval Officer Procurement. Active duty commences and continues while in attendance during their senior academic year. To be eligible for participation, he must be an Ensign, 1915 U. S. Naval Reserve, or agree to accept such an appointment if selected. A board convened in the Bureau of Medicine and Surgery selects the candidates for participation in this program.

(2) Physical standards of this program are the same as those established for Regular Navy staff corps officers.

(3) Active duty orders are mailed to the student via the Professor of Naval Science or the District Commandant. Active duty commences upon receipt of such orders and completion of proper reporting endorsements.

(4) The student agrees, in writing, to accept a Regular Navy commission, and if a Regular Navy commission is not tendered, to accept an appointment in the Naval Reserve.

(5) In accepting an appointment in the Regular Navy or Naval Reserve, as a result of having active service in the Senior Medical Student Program as an Ensign, 1915, he is obligated to serve on active

duty and to retain the commission for a period of three years. This active service will commence upon completion of not more than 12 months of a civilian or Naval Internship. Providing that the student has 24 months obligated military service to perform, this active duty affords a splendid opportunity to discharge the military obligation and serve an additional year in return for the benefits received in the Senior Medical Student Program. With no obligated military service to perform, upon enrollment in the Senior Medical Student Program, the student obligates himself to serve for the same period of three years.

(6) As a medical student, he receives the full pay allowances of an Ensign, 1915, while so enrolled on active duty. Pay and allowances are based on longevity as follows:

(a) Less than two years and no dependents, he receives $338.58 per month; with dependents (a member of his family or household dependent upon him for financial support) he receives $355.68 per month.

(b) Over two but less than three years and no dependents, he receives $366.28 per month; with dependents, he receives $384.38 per month.

(c) Over three and no dependents, he receives $429.28 per month; with dependents he receives $447.38 per month.

(7) In addition to the pay and allowances, the student is credited with 2½ days of annual leave for each 30 days of active duty served.

(8) The wearing of the Naval uniform is permitted only when authorized by appropriate naval authority.

(9) Timing is very important. An average of four months is required to completely process each application. Feb. 1 each year is the absolute deadline that completed applications must be forwarded to the Bureau of Naval Personnel, Navy Department, Washington, D. C. This is necessary so that sufficient time is given to the board in the Bureau of Medicine and Surgery to pass on the professional qualifications and the board in the Bureau of Naval Personnel to pass on the over-all qualifications of each applicant. Those selected are required to meet the moral, mental, and physical standards of Navy acceptance. All applicants will be notified by individual letter of their acceptance or rejection not later than the first week in May.

NAVAL INTERNSHIPS

Naval internships are 12 months in duration, are rotating in type, and conform in all respects with the requirements of the Council on Medical Education and Hospitals of the American Medical Association. These compare most favorably with the best civilian internships and each year the number of applicants considerably exceeds the number of available naval internships. Internships are offered at the U. S. Naval Hospitals located at Camp Pendleton, Calif.; Oakland, Calif.; San Diego, Calif.; Jacksonville, Fla.; Pensacola, Fla.; Great Lakes, Ill.; Bethesda, Md.; Chelsea, Mass.; St. Albans, N. Y.; Philadelphia; Newport, R. I.; Charleston, S. C.; Portsmouth, Va.; and Bremerton, Wash.

All naval interns are selected and matched to the Navy by the National Intern Matching Program, Incorporated. It is not necessary for the medical student to be a participant in the Ensign 1915 USNR Program in order to apply and be accepted for a naval internship. On the other hand, if the Ensign 1915 USNR candidate does not desire a naval internship, he should list only the civilian hospitals in the order of his preference, and in this way he will not be competing with those who desire a naval internship and who request to be so matched. The Ensign 1915 candidate who is matched to a civilian internship will be placed on inactive duty during the period of his internship, following completion of which he will be called to active duty in compliance with his previous service agreement.

The basic requirements for a naval internship include the following: (1) be a graduate or potential graduate of a medical school approved by the American Medical Association; (2) be a citizen of the United States; (3) be registered with and his name appear in the Official Directory of Students published by the National Intern Matching Program, Inc.; and (4) meet the prescribed physical standards for a commission in the U. S. Naval Reserve.

In order to become eligible for consideration for a naval internship, candidates must first make application for a commission in the Naval Medical Corps. This can be accomplished by visiting or writing to the nearest Office of Naval Officer Procurement or the nearest U. S. Naval Hospital in the continental United States. In applying for a naval internship it is recommended that five (5) naval hospitals be listed in the order of preference. Generally assignments are made from among the first three listed. The candidate applies, as far as the matching is concerned, directly to the Navy and not to the specific hospital. If matched to the Navy every effort is made to place the candidate in his first choice, but if this is not possible he will be assigned to another hospital of his choice. In the matching program the student is matched to the service and not to a particular hospital within it.

Applications for commission in the Naval Medical Corps for intern training are accepted between Sept. 1 and Dec. 1 each year. That portion of the application pertaining to internship is accepted between Oct. 1 and Dec. 1. Early submission of applications is strongly recommended.

Any additional information may be obtained from the Chief, Bureau of Medicine and Surgery, Department of the Navy, Washington 25, D. C.

NAVAL RESIDENCY TRAINING PROGRAMS

Eight U. S. naval hospitals are now approved for residency training in the various clinical specialties of medicine and surgery by the Council on Medical Education and Hospitals of the American Medical Association and by the respective American Specialty Boards. These naval hospitals are located at Chelsea, Mass.; St. Albans, N. Y.; Philadelphia; Bethesda, Md.; Portsmouth, Va.; Great Lakes, Ill.; Oakland, Calif.; and San Diego, Calif. Residency training for medical officers is also actively sponsored by the U. S. Navy in selected outstanding civilian hospitals, schools, and medical centers of the United States in those few specialties wherein the Navy does not operate formalized training programs. U. S. Naval Hospital residency training activities embrace the specialties of allergy, anesthesiology, cardiovascular disease, dermatology and syphilology, general practice, internal medicine, neurology, obstetrics and gynecology, ophthalmology, orthopedic surgery, otolaryngology, pathology, pediatrics, psychiatry, radiology, surgery, thoracic surgery, and urology. Formally approved training in civilian institutions is conducted in plastic surgery, neurological surgery, preventive medicine and public health, and in children's orthopedic surgery.

Medical officers eligible for assignment to duty as a resident are Regular Navy officers and those Reserve medical officers who have completed their active service obligations under the Universal Military Training and Service Act, as amended. Requests for residency training duty should be forwarded to the Chief of the Bureau of Medicine and Surgery, Navy Department, Washington 25, D. C. All such requests are acted upon by the Bureau Advisory Board on professional training matters. This board makes recommendations in accordance with the merits of each case, taking into consideration the professional experience, background, and aptitude of the candidate and the needs of the service in the particular specialty in which training is desired. One year of obligated service is required for each year of training received in a Naval hospital. Two years of obligated service are required for the first year of training received in civilian institutions and one year of obligated service for each successive year so spent.

It is the policy of the Bureau of Medicine and Surgery to continue a resident in training until formal requirements, leading to eligibility to undergo examination by an American Specialty Board, have been met. This procedure will be strictly adhered to in every case where the needs of the service permit, barring national emergencies, provided that such an arrangement remains mutually agreeable and satisfactory aptitude and progress as a resident are demonstrated. The highest priority in the assignment of naval medical officers to residency training is given those who have completed or are about to complete a normal tour of active duty with an operational unit of the U. S. Navy at sea or on foreign shore stations.

OTHER GRADUATE TRAINING FOR NAVAL MEDICAL OFFICERS, INCLUDING THE MILITARY MEDICAL SPECIALTIES

Aviation Medicine.—The School of Aviation Medicine at Pensacola, Fla., convenes four classes annually of approximately 30 students, for didactic instruction in aviation medicine and actual instruction in flight and ground school. Each class is of about six months duration. Upon completion of this course of instruction they are designated naval flight surgeons and assigned to a two-year period of operational duty. Additionally, the School of Aviation Medicine is approved for residency training in aviation medicine. This training may be requested after completion of the two year operational duty assignment and consists of one year of public health at a civilian institution and two years of residency training in aviation medicine at the school in Pensacola. They are then considered board eligible for certification in aviation medicine. Further opportunities are available in several large naval laboratories for work in research related to aviation medicine. The laboratories are located at Johnsville, Pa.; Philadelphia; and the School of Aviation Medicine, Pensacola, Fla. A medical officer interested in the aeronautical aspects would do well to consider this advanced training.

Submarine Medicine.—This military medical specialty supports all phases of underwater operations in the Navy. Training in this specialty is particularly applicable to those having an interest in occupational or preventive medicine and research in physiology. The basic six months course of training includes lectures, demonstrations, laboratory work, practical experience, and cruises in submarines, rescue vessels, and tenders as available. The majority of the course is given at the Submarine School and Medical Research Laboratory at the Submarine Base, New London, Conn. Eight weeks of the six months period is spent at the U. S. Naval Deep Sea Diving School, Naval Gun Factory, Washington, D. C., where the student learns about diving by making dives and about the physiological problems involved through classroom and laboratory periods.

Upon completion of a tour of duty with an operational unit the medical officer may apply for postgraduate training in various fields. He may prepare himself for later certification in occupational medicine by attending the academic year at the University of Rochester and later service in nuclear powered submarines or surface vessels. He may prepare for certification in preventive medicine by attending one of the public health schools and subsequent field duty ashore and afloat. He may prepare himself for a career in research by a postgraduate year at the University of Pennsylvania

College of Medicine followed by duty at naval laboratories and with operational units. Clinical medical specialty training in all fields is available and having served with operational units is an additional credit to one's application.

Research Program.—The Navy offers 60 Navy medical officer billets for military medical research careers. These opportunities embrace basic medical research in aviation medicine, submarine medicine, clinical specialties, amphibious and field medicine, tropical and exotic diseases and in the areas of the medical problems of nuclear, biological, and chemical warfare defense. These 60 billets are distributed among 15 in-service laboratories, strategically located throughout the world, and represent the program indicated above.

Amphibious and Marine Corps Field Medicine.—Recognized as an important military operational medical specialty, this training is conducted at Camp Lejeune, N. C., Camp Pendleton, Calif., and the Marine Corps Educational Center, Senior School, Quantico, Va. This specialty offers valuable training in the methods of sorting (triage), management, and evacuation of mass casualties, research and development of field medical equipment, field sanitation methodology and practices, medical logistic support, large scale medical planning, and efficient patient care in field combat.

Nuclear Medicine.—Graduate courses for medical officers are conducted at several U. S. Naval Hospitals, in affiliation with civilian institutions. Additional graduate courses in radiobiology are sponsored by the Navy for medical officers at Reed College, Portland, Ore., and the University of Rochester, Rochester, N. Y., to meet present and future needs of the Navy for personnel trained in the fields of nuclear propulsion, radiological safety and special weapons effects. Formal long courses for radiology and other residents are conducted in the clinical use of radioisotopes at the U. S. Naval Medical School, National Naval Medical Center, Bethesda, Md. This latter course is approved by the Atomic Energy Commission and is designed to fulfill the needs of those who wish to appear for future examination for certification by the American Board of Radiology, as well as those residents in other specialties who may need to acquire a better understanding of the clinical utilization of radioisotopes in diagnostic and therapeutic procedures.

Air Force

The Air Force is presently sponsoring training programs for senior medical students, as well as internships and residencies in both civilian and military hospitals. Applicants must be United States citizens, be morally, physically, and educationally qualified, and must not be nor have been conscientious objectors. Eligibility varies with each program according to the applicant's age.

THE SENIOR MEDICAL STUDENT PROGRAM

The Senior Medical Student Program offered by the Air Force is available to selected Junior Medical students. The application period for this program is Nov. 1 to March 1 of the junior year. Those selected are commissioned as second lieutenants and are sponsored from the date of matriculation to the date of graduation. Upon graduation they must agree to accept reappointment as first lieutenants and apply for either a military or a civilian-sponsored internship. Those not selected for intern training are released from active duty for one year to intern under private contract. Selected students incur a three-year obligation for sponsorship of the senior year. No additional obligation is incurred if they are selected for a sponsored internship.

AIR FORCE SPONSORED INTERNSHIPS, CIVILIAN AND MILITARY

The Air Force Intern Training Program, begun in 1950, is designed as a Regular Officer procurement program. For the year beginning July 1, 1959, the Air Force plans to sponsor 90 interns in military hospitals, selected through the National Intern Matching Program. The Air Force will also sponsor 80 interns in approved civilian hospitals. To be accepted, applicants must meet general eligibility requirements stated above, must not be more than 32 years of age, and must be graduates of medical schools acceptable to the Surgeon General.

Selection for civilian internships is made periodically by the Office of the Surgeon General on the basis of scholastic standing, physical fitness, and military aptitude and inclination. Applications for sponsored civilian intern training beginning July 1 are closed as of April 1 each year; closing date for applications for training beginning on "off-term" dates is announced by letter annually. For military internships, applications must be submitted not later than Dec. 1. Those selected are appointed effective the date of graduation from medical school as first lieutenant, Air Force Reserve (Medical). Military interns incur a minimum period of obligated service of 24 months and civilian interns, 36 months, regardless of their Selective Service classification. However, their military service obligation under the Universal Military Training and Service Act, as amended, will be discharged concurrently with this service.

Civilian interns are assigned to the hospital at which they have obtained an approved internship. Since the program is designed to cover the normal one-year internships, students who have accepted appointments to internships longer than 12 months are not favorably considered for this program. (They may not accept any remuneration from the hospital.)

Military interns are not assured assignment in any specific military hospital, but almost all are assigned according to their first, second, or third choice. Military internships are of the general rotating type so that applicants gain appropriate experience in various fields of medicine. Training is directed by military and civilian physicians and includes a wide range of clinical material, utilizing modern medical, surgical, and radiological facilities. It provides for one year of formal training in accordance with the requirements of the Council on Medical Education and Hospitals of the American Medical Association and is followed by two years of general medical duty in Air Force installations.

RESIDENCY TRAINING PROGRAM

The Air Force Residency Training Program is normally limited to members of the Regular Air Force and is conducted in both military and civilian hospitals (including nonmilitary government hospitals). For the year beginning July 1, 1959, the Air Force program provides for a maximum of 425 residents, 130 in military hospitals and 295 in civilian hospitals. Approximately 110 first-year residency training spaces are available. The spaces are about equally divided between military and civilian hospitals.

Physicians who enter this program are expected to remain in training until they have completed the minimum formal training requirements of the specialty boards. Applications for residency training and a regular commission may be submitted simultaneously and may be submitted at any time after completion of three months of internship. For each year of sponsored training in a military hospital, the period of obligated service incurred is one year; in civilian hospitals, the obligation is two years for the first year of training and one year for each additional year.

Residency training is available on a competitive basis in all recognized medical specialties according to the needs of the Air Force. The requirements are greater, however, for additional officers trained in general practice, pathology, otolaryngology, psychiatry, neurology, and obstetrics and gynecology. Training in the following specialties is available at the USAF Hospital, Lackland Air Force Base, San Antonio, Texas: anesthesiology, general surgery, internal medicine, ophthalmology, orthopedic surgery, pathology, pediatrics, and radiology. Applications for a Regular Air Force Commission and residency training to begin on July 1 should reach Headquarters USAF not later than Nov. 1. In any event, applications should be submitted not later than eight months prior to the beginning date of residency training.

The Aviation Medicine Specialty Training Program leading to board certification in Aviation Medicine is a comprehensive program of five years' duration. Applicants must be graduates of the Primary Course of Aviation Medicine and have had a minimum of nine months practice as an Aviation Medical Examiner. Applicants must be officers of the Regular Air Force, physically and professionally qualified, and be no more than 34 years of age when the class convenes. Applications must arrive at Headquarters USAF not later than Dec. 1 for entrance into program beginning the following September.

MEDICAL EDUCATION FOR NATIONAL DEFENSE

The following information on the status of Medical Education for National Defense, current to July 1, 1958, was submitted by the office of the national coordinator of the program.

The Medical Education for National Defense (MEND) Program is presently active in 45 of the American colleges of medicine, and 10 additional schools are to be selected for affiliation effective Jan. 1, 1959. Requests for MEND-affiliation have been considerably in excess of the program's ability to expand, and a waiting list for affiliation is maintained.

The 45 schools presently taking part in the program are Albert Einstein, Baylor, Bowman Gray, Buffalo, California (San Francisco), University of California at Los Angeles, Colorado, Columbia, Cornell, Creighton, Duke, Emory, Georgetown, Howard, Illinois, Iowa, Kansas, Louisiana State, Louisville, Maryland, College of Medical Evangelists, Miami, Michigan, Mississippi, New York University, North Carolina, Northwestern, Ohio State, Oklahoma, Pennsylvania, Pittsburgh, Rochester, Stritch, Temple, Texas (Galveston), Tufts, Tulane, Vanderbilt, Vermont, Medical College of Virginia, University of Virginia, Washington University (St. Louis), University of Washington (Seattle), Western Reserve and Wisconsin.

MEND is a function of the MEND Program subcommittee of the Association of American Medical Colleges; it is endorsed by its parent organization, by the American Medical Association Council on Medical Education and Hospitals and the Council on National Defense, and by medical officials of the Department of Defense, Army, Navy, Air Force, Public Health Service, and the Office of Defense and Civilian Mobilization. It has received the approval and cooperation of a wide variety of federal and private medical and educational activities.

The purpose of the program is to encourage the teaching of principles of military and disaster medicine by regular faculty members of our medical colleges. Nothing is mandatory; each faculty is free to accept or reject any part of the program not consistent with the local philosophy of medical education. All emphasis is on medical rather than military topics. It is hoped that the problem of national preparedness in medical education can be solved by interested faculty members on a local

basis and under local control rather than through such methods as the establishment of a federal medical school or through direct federal intervention in curricular content.

Annually, MEND sponsors a series of symposia, with these programs being conducted by federal medical personnel for representatives of nongovernmental medical education. During 1957-1958, two programs were conducted: "Management of Mass Casualties" at the Walter Reed Army Institute of Research in Washington, D. C., and "Medical Aspects of Highway Safety" at Ann Arbor, Michigan. The former program attracted 64 participants, and the latter, presented by the Public Health Service, was attended by 102. Each year MEND also conducts an Orientation Tour for deans and coordinators of newly-MEND-affiliated schools, designed to introduce them to current problems and trends in the federal services.

Activities at the 45 colleges have included special lectures, conferences, and demonstrations in the following subjects: surgery of trauma, wound ballistics, war wounds, radiobiology, defense measures to chemical and biological warfare, aviation medicine, management of mass casualties, civil defense responsibilities of the medical profession, infectious disease problems in disaster situations, and others.

The national coordinator of MEND has an office at the Bureau of Medicine and Surgery, Department of the Navy, Potomac Annex, Washington 25, D. C.

AREAS ALLIED TO MEDICINE

SCHOOLS FOR MEDICAL RECORD LIBRARIANS

The Council has worked closely with the American Association of Medical Record Librarians since 1942 in the development of criteria for and evaluation of educational programs in medical record library science. Initial and continued approvals of schools are considered by the Council on the basis of the recommendations of the Committee on Education and Registration of the American Association of Medical Record Librarians, which has an able education director who makes periodic survey-visits to schools. Significant studies to further advance training in the field are being carried out effectively by the American Association of Medical Record Librarians.

Revision of the curriculum currently recommended by the Council and the American Association of Medical Record Librarians is under active consideration. Revisions will be gradually implemented and based upon studies which will not be completed for several years. The following is abstracted from the statement of the American Association of Medical Record Librarians on one of the studies, "The Functions and Education of Medical Record Personnel" carried out by the University of Pittsburgh:

To implement the recommendations of the study, the American Association of Medical Record Librarians proposes to utilize its education consultant, education director and Education and Registration Committee to develop a detailed sample curriculum along the lines proposed to submit to academic institutions interested in establishing medical record science programs. It is suggested that for purposes of evaluation, this method of education be tried in a limited number of colleges and universities.

The proposed curriculum, however, varies radically in its approach to teaching medical record personnel from that currently being used in existing schools. To familiarize directors and instructors with all types of teaching methods, and, also, to develop cooperatively more and better teaching materials, the Association plans to expand its present program of workshops. It proposes, also, to recommend revision of the Essentials for an Acceptable School for Medical Record Librarians (to the Council on Medical Education and Hospitals). As they stand, these Essentials not only preclude the curriculum recommended by this study, but they also conflict with the academic requirements of those colleges and universities which at the present time are affiliated with medical record librarian schools.

The Association appreciates that the proposals so far discussed are long range in nature and cannot immediately meet the acute shortage of trained medical record personnel. Accordingly, it proposes an accelerated in-service training program for medical record personnel which will improve the skill of untrained workers but will in no way produce professional medical record librarians.

As of June 30, 1958, there were 30 approved schools. Student enrollment increased in 1957 to 161 students in the senior class of degree programs and in certificate programs, which represents an 11% increase over 1956. There was a training capacity for 212 students in these programs, but three schools had no students enrolled during 1957. Accordingly, the occupancy rate was 40% for the senior class of 9 degree programs with senior students in 1957 and 85% in the 19 active certificate programs. Since students were separately enrolled in both programs offered by one school, students were enrolled in 28 programs offered by 27 schools. The number of graduates for six degree programs was 34. In addition, there were 105 graduates from 20 certificate programs or a total of 139 graduates from 25 schools in 1957.

Approved schools offer curricula which include theoretical instruction and practical training in hospitals. When the hospital training is sequentially and properly integrated with collegiate studies, a degree is available after four years of study. Among the 10 schools offering degree programs, 7 admit qualified high school graduates, and 3 schools offer a curriculum of 12 months' duration with admission requirements of three years of preparatory collegiate preparation. In the 21 schools offering certificate programs of one year's duration, 15 require two years of college prior to admission. All but two of these 17 schools will also admit graduates from an accredited school of professional nursing of at least three years' duration. A college degree is required for admission into four certificate programs. Lists of approved schools are available from the Council. Applicants should write directly to the Medical Record Librarian-Director of the School.

Schools conducting degree programs usually begin in June, and the majority of certificate programs admit students in September. Tuition ranges from $66 to several hundreds of dollars per year, and one school requires none. Application for approval by a hospital or university should be made to the Council on Medical Education and Hospitals of the American Medical Association.

SCHOOLS FOR MEDICAL RECORD TECHNICIANS

Schools for medical record technicians are conducted to train the medical record technician who, working under the supervision of a qualified medical record librarian or a medical record committee, performs the technical tasks associated with the maintenance and custody of medical records.

As in the case of schools for medical record librarians, the Council has developed educational criteria for and evaluates schools in close collaboration with the American Association of Medical Record Librarians.

The training of medical record technicians should be conducted in acceptable general hospitals having a minimum of 4,000 annual admissions. These admissions should include an adequate distribution of patients in the various clinical services commonly found in general hospitals. Candidates for admission to an approved school should be proficient in typing and preferably also in shorthand. They should have completed the requirements for high school graduation or should have passed a college entrance examination for admission to an accredited college or university. The minimum length of training is nine months and should include theoretical instruction in anatomy, medical terminology, and medical records, with additional practical training in admitting and discharge procedures, indexing, preparation of reports, and other activities associated with the medical record department.

There are 11 hospitals approved by the Council for training medical record technicians. These schools reported a training capacity for 73 students with an enrollment of 58 students and 37 graduates in 1957. Data for 1956 are 10 schools with a training capacity for 69 students, an enrollment of 55 and 37 graduates. Qualified high school graduates are accepted for courses of from 9 to 12 months' duration.

Hospitals should apply to the Council on Medical Education and Hospitals for approval. Special forms will be supplied for this purpose, and, when the required information has been received, the proposed training program will be reviewed in collaboration with the Committee on Education and Registration of the American Association of Medical Record Librarians. The institutions applying for Council approval will, in all instances, receive full information and every possible assistance in the planning and development of training programs in accordance with present standards. There continues to be an acute shortage of qualified medical record librarians and medical record technicians. Excellent opportunities exist for graduating students. Inquiries on career opportunities, registration, and accreditation of qualified medical record personnel should be addressed to the American Association of Medical Record Librarians, 510 N. Dearborn St., Chicago 10.

SCHOOLS FOR MEDICAL TECHNOLOGISTS

In its continuing efforts to assist hospitals in the development of training programs for medical technologists, the Council cooperates closely with the American Society of Clinical Pathologists, the Board of Schools of Medical Technology, the Board of Registry of the Society, and the American Society of Medical Technologists. The board of schools was established by the society in 1949 to serve as the major advisory body to the Council in all matters relating to standards and the evaluation of educational programs. Revisions of the standards occurred in 1941, 1943, 1947, 1949, 1953, and June, 1958. The significant revision is that, effective Jan. 1, 1962, entrance requirements will be increased from two to three years of pretechnical collegiate education. No major change has been made in the 12 months' technical curriculum in the hospital. It is expected that the third year of college will provide emphasis on general education yet also afford, in appropriate balance, selected courses to broaden the students' science background. Schools not currently affiliated with colleges and universities are encouraged to consider affiliation or affiliations whereby a consecutive educational sequence of three years of college and one year of hospital training will lead to a baccalaureate degree. While such affiliation is not required, it is encouraged on the basis of the inherent educational benefits to students and faculties and the favorable experience of currently affiliated hospital schools.

As of June 30, 1958, there were 681 approved schools, or an increase of almost 4% over the 656 schools approved in 1957. Enrollment increased 6% to 3,099 students in 1957 and the number of graduates was 2,285, which represents a 7% increase over 1956. With a student capacity of 5,186, the occupancy rate in 1957 was 60%. The increases in student enrollment and number of graduates reflect the effective recruitment program of the National Committee for Careers in Medical Technology sponsored by the College of American Pathologists, American Society of Clinical Pathologists, and American Society of Medical Technologists and the concerted recruitment activities of the faculties of approved colleges and universities.

Eighty per cent, or 545 training programs, base admission on two years of college; 90 (13%) require three years of preclinical college education; and 46, or 7%, require a baccalaureate degree for admission.

The number of hospital schools with college or university affiliations continues to increase. In 1957, a total of 490 hospital schools (72%) had college or university affiliations. Such affiliations as noted

above are strongly encouraged since they stimulate the development of well-organized training programs suitably integrated with the college curriculum and also serve as a continuing source of students. If properly integrated, a degree is available upon completion of three years of college education followed by one year of hospital training in 452 (66%) of the 681 approved schools. Active liaison between the hospital and the affiliated college is strongly recommended through regularly scheduled meetings of an advisory or coordinating committee comprised of representatives from each faculty.

The minimum duration of the hospital course acceptable for approval is 12 months. Ninety per cent, or 616 schools, offer a course of 12 months' duration. The remaining 10% of the programs vary from 12½ to 36 months in length. Tuition is required by 158 (23%) and a minimal breakage fee by 67, or less than 10%, of the schools. Students receive a stipend in 370 (54%). All states, the District of Columbia, the Canal Zone, Hawaii, and Puerto Rico have approved schools. Interested high school students should apply to accredited colleges and universities of their choice; those students in college or with collegiate backgrounds should apply to the pathologist-director of the laboratory school of their choice. Lists of approved schools of medical technology, which indicate those schools that have college affiliations, are available from the Council.

Application for approval of a school for the training of medical technologists should be made to the Council on Medical Education and Hospitals of the American Medical Association. Forms will be supplied for this purpose on request and should be completed by the director of the laboratory requesting this approval. Inquiries regarding the registration of qualified medical technologists should be addressed to the Board of Registry of Medical Technologists, 611 W. Howard St., Post Office Box 44, Muncie, Ind.

SCHOOLS FOR OCCUPATIONAL THERAPISTS

Through a cooperative liaison which began in 1933 on the request of the American Occupational Therapy Association, the Council has developed standards for the education of occupational therapists. These were initially adopted by the House of Delegates in 1935, and subsequent revisions have been approved in 1938 and 1949. Recommendations for periodic revisions of standards and on initial and continued approvals of curricula are submitted to the Council by two advisory groups, the Advisory Committee on Occupational Therapy Education of the Council on Medical Education and Hospitals and the Council on Education of the American Occupational Therapy Association. The recently appointed advisory committee consists of nine physician members nominated by national organizations in the fields of chest diseases, general surgery, internal medicine, neurology, orthopedic surgery, pediatrics, physical medicine and rehabilitation, psychiatry, and medical education. In addition, there are three occupational therapist members nominated by the American Occupational Therapy Association, and its Director of Education serves as a consultant. Surveys of schools are conducted by joint physician-therapist teams and submitted to the advisory groups which formulate recommendations for final action by the Council. Conferences and basic studies are being carried out by the American Occupational Therapy Association, with the assistance of other organizations, to further advance educational opportunities in the field.

As of June 30, 1958, there were 29 approved schools, 1 of which was on a stand-by basis during 1957. Statistics for total degree and certificate student enrollment and graduates for the academic years 1956, and 1957 and 1958 based upon data submitted to the American Occupational Therapy Association are shown in table 57.

Training for an occupational therapist includes a good general collegiate education coordinated with theoretical and technical instruction in occupational therapy and supervised clinical practice in hospitals. Certificate and/or degree recognition are available, and those so recognized have equal professional status. Programs leading to a baccalaureate degree are generally of four years duration, and schools offering this curriculum accept qualified high school students and transfer students. Certificate programs are predominantly 18 months in duration and accept students with a baccalaureate degree. However, since universities have individual policies on transfer students, interested undergraduates are encouraged to contact schools of their choice early in their collegiate careers to determine admission requirements for the certificate and/or degree programs in a given school. Tuition in all teaching centers closely parallels college fees. Most courses begin in September or February. Lists of approved schools are available from the Council.

TABLE 57.—*American Occupational Therapy Association Statistics for Total Degree and Certificate Student Enrollment and Graduates for the Academic Years 1956-1958.*

Year	Total Student Enrollment	Graduates
1956	4,903	969
1957	4,522	490
1958	4,083	511

Application by schools for approval of an educational program in occupational therapy should be made to the Council on Medical Education and Hospitals of the American Medical Association. Forms will be supplied for this purpose on request. They should be completed by the administrator of the institution requesting approval. Inquiries regarding career opportunities in the field of occupational therapy and the registration of qualified therapists should be addressed to the American Occupational Therapy Association, 250 W. 57th St., New York 19.

SCHOOLS FOR PHYSICAL THERAPISTS

On the request of the American Physical Therapy Association, the Council developed standards that were adopted by the House of Delegates in 1936. The Council, in cooperation with its advisory groups, the Council on Physical Medicine and Rehabilitation of the American Medical Association and the American Physical Therapy Association, has periodically submitted revised standards to the House of Delegates, which were adopted in 1943, 1949, and 1955. In 1955, the Council on Physical Medicine and Rehabilitation became the Council on Medical Physics, with which there continues close liaison on matters pertaining to physical therapy but which no longer functions in an advisory capacity on physical therapy education. Applications of new schools are reviewed in collaboration with two groups, the Advisory Committee on Physical Therapy Education of the Council on Medical Education and Hospitals and the American Physical Therapy Association. The Advisory Committee on Physical Therapy Education consists of nine physician members who are nominated by national organizations representing the fields of physical medicine and rehabilitation, orthopedic surgery, psychiatry and neurology, internal medicine, pediatrics, general surgery, and medical education. In addition, there are three members who are physical therapists, two nominated by the American Physical Therapy Association and one nominated by the American Registry of Physical Therapists. The senior educational consultant of the American Physical Therapy Association attends meetings as a consultant. Surveys of new and existing schools are conducted by joint physician-therapist teams and recommendatory action submitted by the advisory groups to the Council for action. Active liaison which the medical directors, therapist educational administrators, and other members of the teaching faculties in approved schools is being implemented through more frequent periodic surveys.

TABLE 58.—*American Physical Therapy Association Statistics for Degree and Certificate Enrollment for the Academic Years 1956-1957*

Year and Class	Schools Reporting, No.	Senior (Degree) and Certificate Students Enrolled, No.	Graduates, Total No.
1956 Senior	25	800	701
1956 Certificate	28		
1957 Senior	14	700	750
1957 Certificate	30		

As of June 30, 1958, there were 37 approved schools. On the basis of data reported to the American Physical Therapy Association, fall enrollment statistics for the senior class of degree programs and for the certificate programs and the number of graduates for 1956 and 1957 are shown in table 58.

Certificate and/or degree recognitions in physical therapy are available, and those so recognized have equal professional status. Most schools offer both degree and certificate programs, and either or both recognitions are available, depending upon a student's preparatory collegiate education. Certificate programs are usually 12 months in duration. The courses are open to students with two or three years of college or those who have graduated from a nationally accredited school of professional nursing of at least three years' duration. The majority of degree programs are four years in length and admit qualified high school graduates and transfer students. Interested undergraduates are encouraged to contact the school of their choice early since admission and transfer requirements vary. Tuition varies in accord with university fees and the majority of courses begin in September and February. Lists of approved schools are available from the Council.

Application for approval should be made to the Council on Medical Education and Hospitals of the American Medical Association. Forms will be supplied for this purpose on request. They should be completed by the administrator of the institution requesting this approval. Inquiries regarding voluntary registration of qualified therapists should be addressed to the American Registry of Physical Therapists, 30 N. Michigan Ave., Chicago 2. Information on requirements for state registration or licensure is available from the Board of Examiners of the states concerned. Inquiries regarding careers in the field of physical therapy should be addressed to the American Physical Therapy Association, 1790 Broadway, New York 19.

SCHOOLS FOR X-RAY TECHNICIANS

The Council has been ably assisted by the American College of Radiology, the American Registry of X-ray Technicians, and the American Society of X-ray Technicians in revising criteria for training and evaluating educational programs in x-ray technology. These advisory groups participated in the most recent revision of the standards adopted by the House of Delegates in December, 1955. Particularly encouraged is progressive training in radiation therapy to afford students at least one month's practical experience intramurally or through affiliation.

Schools making application for approval are surveyed by state and regional councilors appointed by the American College of Radiology. Radiologists appointed by the College also periodically resurvey approved schools, and these radiologists are currently revisiting approved schools. Their tremendous and voluntary contribution of time and experience are a major asset in the program. All data are evaluated by the Committee on Technician Affairs of the American College of Radiology and recommendations submitted to the Council for final action.

As of June 30, 1958, there were 557 schools approved by the Council for training x-ray technicians, which represents an increase of almost 8% over the 517 approved in 1957. Enrollment for 1957 increased 901 or 28%, to a total of 4,113 students. The training capacity increased 22% in 1957 over 1956 to a total of 4,848. The number of graduates increased 7% to a total of 2,109 in 1957.

The minimum admission requirement is high school graduation. A total of 539 schools (97%) admit students directly out of high school, 13 schools (2%) require one year of college, 4 schools (1%) require two years of college, and one school accepts only registered nurses.

The length of training in 335 (60%) is 24 months, 12 months in 129, (24%), 18 months in 59 (10%) and varies from 13, 14, 15, 36, and 48 months in 5%. Five schools offer two courses of 12 or 24 months duration. Tuition is required by 193 (35%) and 73 pay students a stipend. Collegiate affiliations have been established by 181 (35%) of approved schools. Students should apply directly to the radiologist-director of an approved school. Lists of approved schools are available from the Council on request.

Applications for approval of schools of x-ray technology should be submitted to the Council on Medical Education and Hospitals of the American Medical Association, 535 N. Dearborn St., Chicago 10. Inquiries regarding registration of qualified x-ray technicians should be addressed to the American Registry of X-ray Technicians, Metropolitan Building, Minneapolis 1.

References

1. Bowers, J. Z., and Parkin, R. C.: Wisconsin Preceptor Program: Thirty-Year Experiment in Medical Education, J. M. Educ. **32**:610-12 (Sept.) 1957.

2. Page, H. A., and Anast, P. P.: Alumni Evaluation of Wisconsin Preceptoral Programs, J. M. Educ. **32**:613-617 (Sept.) 1957.

3. Dingle, J. H., and others: Approach to Evaluation of Medical Education at Western Reserve University, J. M. Educ. **33**:113-117 (Feb.) 1958.

4. Horowitz, M. J.; Brozgal, J. L.; and Eaton, J. W.: Observations of First-Year Students in Preceptoral Groups, J. M. Educ. **33**:118-131 (Feb.) 1958.

5. Merton, R. K.; Reader, G. G.; and Kendall, P. L.: Student-Physician: Introductory Studies in the Sociology of Medical Education, Boston, Harvard University Press, 1957, p. 360.

6. Moses, C.; Gregg, L. A.; and Danowski, T. S.: J. M. Educ. **33**:501-507 (June) 1958.

7. McKittrick, L. S.: Reason Underlying Conference on Medical Education and Licensure, J. A. M. A. **167**:21-23 (May 3) 1958.

8. Allman, D. B.: American Medicine: Its Responsibilities in Planning for Future Needs in Medical Education, J. A. M. A. **167**:23-26 (May 3) 1958.

9. Medical Education in the United States and Canada, Council on Medical Education and Hospitals, J. A. M. A. **159**:570 (Oct. 8) 1955.

10. Kirk, D.: Population Characteristics and Trends and Their Implications in Medical Education, J. A. M. A. **167**: 26-30 (May 3) 1958.

11. Parsons, T.: Some Trends of Change in American Society, J. A. M. A. **167**:31-36 (May 3) 1958.

12. Kestnbaum, M.: Changing Characteristics of Our Economy, J. A. M. A. **167**:36-40 (May 3) 1958.

13. Hussey, H. H.: Changing Dimensions of Medical Knowledge: Their Implications for Medical Education, Research, and Practice, J. A. M. A. **167**:40-47 (May 3) 1958.

14. Darley, W.: Undergraduate Medical Education and the Changing Status of Patients, J. A. M. A. **167**:182-186 (May 10) 1958.

15. Hamilton, T. S.: Problems in Specialty Training Created by Changing Status of Patients, J. A. M. A. **167**:187-192 (May 10) 1958.

16. Zintel, H. A.: Postgraduate Surgical Training and Changing Economic Status of Patients, J. A. M. A. **167**:211-214 (May 10) 1958.

17. Williams, R. H.: Future Training in Medicine and Medical Specialties, J. A. M. A. **167**:192-199 (May 10) 1958.

18. Lawson, R. B.: Aspects of Pediatric Residency Training, J. A. M. A. **167**:200-202 (May 10) 1958.

19. Barnes, A. C.: Problems in Training in Obstetrics and Gynecology Due to Changing Status of Patients, J. A. M. A. **167**:202-206 (May 10) 1958.

20. Burgess, A. M., and Leonard, J. C.: Community Hospital and Graduate Education Today, J. A. M. A. **167**:206-210 (May 10) 1958.

21. Medical Education in the United States and Canada, Council on Medical Education and Hospitals, J. A. M. A. **165**:1402-1403 (Nov. 16) 1957.

22. Medical Education in the United States and Canada, Council on Medical Education and Hospitals, J. A. M. A. **159**:570 (Oct. 8) 1955.

23. Carroll, A. J.: Study of Medical College Costs, Association of American Medical Colleges, 1958.

24. Knott, L. W.; Gooch, M.; and Hillard, H. E.: The Cost of Medical Education, J. M. Educ. **33**:429-444 (May) 1958.

25. Darley, W.: Preface to Study of Medical College Costs, Association of American Medical Colleges, 1958.

26. Graduate Medical Education, Report of Commission on Graduate Medical Education, University of Chicago Press, 1940.

27. Flexner, A.: Medical Education in Europe, Carnegie Foundation, New York, 1912, Introduction, pp. viii-ix.

28. Cain, A. S.: Survey of Postdoctoral Fellowships by National Academy of Sciences–National Research Council, Council on Medical Education and Hospitals, J. A. M. A. **165**:1963-1964 (Dec. 14) 1957.

29. Medical Education in the United States and Canada: Conclusions and Recommendations of Council on Medical Service Relating to Private Practice of Clinical Faculty Personnel, Council on Medical Education and Hospitals, J. A. M. A. **161**:1651-1653 (Aug. 25) 1956.

30. Medical Education in the United States and Canada, Council on Medical Education and Hospitals, J. A. M. A. **165**:1431-1437 (Nov. 16) 1957.

31. Gee, H.: Annual Study of Applicants, J. M. Educ., to be published.

32. Medical Education in the United States and Canada, Council on Medical Education and Hospitals, J. A. M. A. **165**:1423-1426 (Nov. 16) 1957.

33. Medical Education in the United States and Canada, Council on Medical Education and Hospitals, J. A. M. A. **158**:588-589 (Oct. 8) 1955.

34. Gee, H.: Personal communication, to be published.

35. Admission Requirements of American Medical Colleges (including Canada), Association of American Medical Colleges, 1955-1956, 1956-1957, 1957-1958, 1958-1959.

36. Admission Requirements of American Medical Colleges (including Canada), Association of American Medical Colleges, 1958-1959.

37. Open Doors, 1958, New York, Institute of International Education.

38. Medical Education in United States and Canada, Council on Medical Education and Hospitals, J. A. M. A. **161**:1661-1663 (Aug. 25) 1956.

39. Postgraduate Courses for Physicians, Council on Medical Education and Hospitals, J. A. M. A. **167**:1953-2009 (Aug. 16) 1958.

THE JOURNAL
OF THE AMERICAN MEDICAL ASSOCIATION
Edited Under the Direction of the Board of Trustees

Editor and Managing Publisher . AUSTIN SMITH, M.D.
Associate Editor . . . . . JOHNSON F. HAMMOND, M.D.
Assistant Editors . . . . . WAYNE G. BRANDSTADT, M.D.
FREDERIC T. JUNG, M.D.
EDWARD R. PINCKNEY, M.D.
Assistant to the Editor . . . . . MILTON GOLIN
Editor for Medical Literature Abstracts . GEORGE HALPERIN, M.D.
News Editor . . . . . CHARLES CHAPMAN

Subscription price . Fifteen dollars per annum in advance
Cable Address . . . . . "Medic, Chicago"

THE PURPOSE OF A MEDICAL SCHOOL

IN THEIR introductory statement Sheehan and Taylor [1] indicated that the training of the physician, the search for new knowledge, and the care of the sick are the inseparable threefold facets which constitute the mission of a medical school. It is only through long training in the scientific methods of investigation and by actual care of patients that medicine can be passed on to succeeding generations. Research, which is the background of progress in medicine, turns to the medical school for its investigators and to patients for its problems, with the future of medical care dependent on the production of a continuing supply of physicians and the potentialities of new discovery. "The purpose of a medical school . . . can only be achieved by endeavor in all three directions—medical education, research, and community care—and they must be carried on simultaneously, for they are wholly dependent upon each other, not only for inspiration but for their very means of success."

Every school has the duty and obligation to strive for excellence in each of its three functions to the extent of its individual potentials. There can be no question but that the quality of medical education and research determine the standard of medical care which the nation is to enjoy. It is also true that medical care will be only as good as the men and women who are responsible for it. Thus, in the overall chain of responsibility leading to the objective of preparing medical students, interns, residents, and graduate physicians to render the best possible medical care, the medical schools play key roles as guardians of the health of the community.

If this guardianship is to be fully effective it is essential that those responsible for the conduct of modern medical schools recognize the continuing challenge with which they are confronted. To make the role of the medical schools achieve maximum potential it is vitally important that the medical profession recognize and support the efforts of the schools to meet the challenges presented to them by these threefold areas of responsibility.

The past two generations have witnessed such rapid strides in medical knowledge that the very nature of medical practice and many phases of medical education have been altered. At the present time there is every reason to believe that the next two generations will witness even greater advances in knowledge and continuing dramatic changes in medical practice. Medical education will face challenges to test the ingenuity and imagination of its most outstanding leaders. Many diseases common three decades ago are rarely observed today, while others present increasingly frequent and provocative problems. Along with the changing panorama involved in prevention, diagnosis, and therapy there are also the tremendous challenges presented by changing social and economic characteristics and trends which hold significant implications for medical care and medical education. It is of great importance that these problems and challenges be as clearly defined as the changing scene permits and that they be objectively studied in proper perspective. Their solution should be continuously sought through the mutual efforts of all individuals and organizations concerned with medical education, research, and care. One of the major purposes of a medical school should be to endeavor to inculcate in its faculty and in the students who represent the physicians of the future an acceptance of the constancy of change and the challenge for constructive adventure which it affords if medical education and medical care as well as research are to effectively meet the needs of the changing scene.

THE FULL-TIME FACULTY DEFICIT

During the past several years the annual report on Medical Education in the United States and Canada has included an analysis of the budgeted, unfilled full-time faculty positions in medical schools in the United States. The report for last year indicated a total of 331 such vacancies for 1956-1957, an increase from 258 in 1954-1955 and from 251 in 1955-1956. Tables 16 and 17 in the text of this report present a departmental analysis of both new and old budgeted unfilled full-time faculty positions, which total 619 for 1957-1958. This increase of approximately 90% of such vacancies in the interval of a single year presents a problem of major concern to medical education. Its magnitude, unless the trend is reversed, has developed to the point where it may jeopardize certain aspects of medical education, research, and care in the period that lies ahead.

1. Sheehan, D., and Taylor, H. C., Jr.: Introduction to Mission of Medical School, ed. 2, revised, New York, New York University Press, 1950.

Although some of the increase in budgeted, unfilled full-time faculty positions represents additional needs presented by newly developing institutions, this circumstance accounts for a relatively small number of the vacancies reported. In 1957-1958 all newly budgeted unfilled full-time positions totaled 196, of which 71 were in the basic medical sciences and 125 in the clinical areas. This represented a total increase of 48 over the 148 reported in 1956-1957 when there were 55 such vacancies in the basic medical sciences and 93 in the clinical departments. The major, and most alarming, aspect of the current report for 1957-1958 lies in the number of old (not newly created) budgeted, unfilled full-time faculty positions. In the basic medical sciences the number had increased to 168 for 1957-1958 as compared to 89 in 1956-1957. In the clinical departments there were 255 such unfilled positions in 1957-1958 compared to 94 in 1956-1957.

Those concerned with medical education are confronted with a challenge necessitating serious analysis, together with the development of the means of resolving this problem in the future. There is general indication of the need for increasing facilities for medical education which will reflect itself in the need for larger numbers of adequately qualified full-time faculty personnel in both basic medical science and clinical areas. Thus, medical education finds itself on the horns of a dilemma with the medical schools now in operation unable to fill the existing full-time faculty positions while at the same time advocating the development of new schools which will necessitate many additional full-time faculty personnel.

What has been responsible for this problem? Why are so many budgeted full-time faculty positions unfilled? What can be done to reverse the trend of the past few years and eventually to resolve the personnel problem it has created? These and many associated questions merit careful study and require definitive action. There are more people engaged in medical research today than ever before but the competition for qualified personnel in this area constantly increases. The tremendous expansion of research programs in such organizations as the Public Health Service (National Institutes of Health), the pharmaceutical industry, and other organizations have presented competitive opportunities for personnel in basic sciences. Economic competition in the form of laboratory activities or private practice undoubtedly continues to play a significant role. With due regard to these and other factors, the fact remains that the problem of obtaining and maintaining adequate full-time faculty personnel for those disciplines where such personnel are essential to the teaching and research activities of modern medical schools represents a constant and increasingly difficult challenge. Failure to meet it may seriously interfere with the ability of medical education to maintain and advance its standards as well as prevent the successful expansion and development of needed new facilities. The challenge is one that cannot be ignored.

BALANCES TO BE CONSIDERED IN INTERNATIONAL EDUCATIONAL EXCHANGE OF MEDICAL STUDENTS

In its presentation of the section of the annual report on medical education dealing with International Educational Exchange in Medicine, the Council on Medical Education and Hospitals has published two tables (47 and 49) which are worthy of careful thought. The data in these tables indicate that for every foreign student receiving his basic medical education in the United States, there are seven United States students undertaking medical studies outside of this country and Canada.

In all fields of higher education, the quality of the students and the educational program are of major significance in determining the level of educational objectives that can be achieved. Because of the close relationship between the product of medical education, the physician, and the health and welfare of the public, there must be a peculiar concern with these qualitative factors in medicine.

Admissions policies of medical schools in the United States generally make it difficult for any but unusually competent students from other countries to be accepted. The foreign student who gains a position in a United States medical school wins that place by successfully competing with United States students and, because of restrictions of admissions policies, most often he has competed with the more able United States students. Thus, the relatively few foreign students in United States medical schools in general represent a rather high quality of scholastic achievement and potential. Their academic achievement can usually be judged against a familiar yardstick since they commonly have had at least a part of their college preparatory studies in the United States.

Since World War II, in comparison with foreign students enrolled in United States medical schools, there has been an increasingly large number of United States students studying medicine abroad. In the years immediately after the war, the numbers of United States students seeking careers in medicine exceeded the available positions in our schools. During this period, there undoubtedly were many students who, although qualified for medical study by our usual standards, could satisfy their career plans only by gaining admission to medical schools in other countries. In the past six years, on a national basis, the number of qualified students desiring places in our medical schools has not been excessive to the number of places available.

In the face of this relative equilibrium between United States medical school positions and students interested in and competent for medical study,

there continues to be a growing number of American citizens undertaking basic medical study abroad. Undoubtedly, a portion of these students are primarily motivated by a desire to join preparation in medicine with the opportunity for cultural enrichment afforded by foreign study. On the other hand, it seems likely that many of the American students enrolling in foreign medical schools do so because they have not been considered fully qualified for admission to medical schools in this country. Of the many inquiries received by the Council on Medical Education and Hospitals from students contemplating medical study outside the United States and Canada, it has commonly been evident that the inquirer has made earlier, unsuccessful attempts to enter medical schools in this country.

The stakes in the international exchange of students, when considered in their broadest implications, are of imposing significance. Medical exchange involves not only these broad political and cultural considerations but also the narrower, yet very important, consideration of the immediate and future impact of the exchange on health care. At the medical student level, there may be reason for concern that our side of the balance as the sending nation is maintained more by quantitative weight than the receiving side of the balance, which appears to be weighted more by qualitative factors.

FUNNEL CHEST

References to funnel chest in the literature are increasing because of a change in attitude toward indications for operative treatment and some controversy regarding the best type of operation. This apparently hereditary anomaly results from a failure of normal development of the anterior portion of the diaphragm. Earlier writers considered attempting surgical correction only in patients who showed evidence of cardiorespiratory embarrassment, but with modern advances in chest surgery the indications have been greatly liberalized. Although improvement of the appearance of the chest may not be very important in itself, Sutherland [1] called attention to the bad psychic effects in a child of having a deformity that is all too obvious in a gymnasium or natatorium. These children become shy, withdrawn, and depressed. The rapid improvement in personality after surgical correction is itself a sufficient justification of the procedure.

In addition to psychic symptoms funnel chest is associated with such postural disorders as an upper thoracic kyphosis, protuberant abdomen, and forward displacement of the neck and shoulders. In severe cases the patient cannot cough effectively and so becomes prone to chronic bronchitis and bronchiectasis. If not corrected the deformity slowly progresses throughout childhood, and the heart becomes displaced to the left. Functional murmurs and cardiac arrhythmia are commonly observed and the electrocardiogram shows right axis deviation.[2] Although pulmonary function is not severely hampered, these patients often have poor physical endurance. Surgical correction not only relieves cardiorespiratory embarrassment when present but also improves posture if performed at an early enough age. Although patients may be operated on for this condition at any age, the operation for infants devised by Brown has been generally abandoned. Ravitch [3] stated that the earlier the condition is corrected the better, the youngest patient in this series being 3 months old. Others [4] preferred to wait until the child is between 3 and 5 years of age.

Sutherland found that preoperative physiotherapy and postural corrective measures were of little or no value. He stated that in children 3 to 5 years of age if the deformity is not too severe it is necessary only to divide the xiphoid and the strong retrosternal ligaments from the sternum. In older children a wedge-shaped osteotomy is performed at the point of sternal angulation sufficient to produce a slight overcorrection. The periosteum is sutured and with healing the overcorrection disappears. Ravitch stated that no external traction is needed in children. He resected from three to five costal cartilages bilaterally. Holmes [4a] did not resect the costal cartilages but restored their normal shape by means of wedge osteotomies at the costochondral junctions and used a Steinmann pin to maintain external traction. In his series Daniel [5] used external fixation on the first two patients then gave it up as wholly unnecessary. Although either a transverse or a midline incision may be used Baronofsky [6] stated that a transverse incision under the breasts gives the most inconspicuous scar and has less of a tendency to keloid formation than a longitudinal scar.

Sutherland encouraged deep breathing exercises as soon as the child came out of anesthesia and this was continued twice daily. He stated that the chest wall was firm in two weeks, after which postural exercises should be given for a prolonged period. In addition to improvement in posture and mental outlook these children show a marked increase in exercise tolerance. Their dyspnea and cardiac arrhythmia disappears. These results more than justify the operation.

1. Sutherland, I. D.: Funnel Chest, J. Bone & Joint Surg. 40:244-251 (May) 1958.

2. Vogl, A., and Elsbach, P.: Cardiac Displacement in Pectus Excavatum, Ann. Int. Med. 47:145-152, July, 1957.

3. (*a*) Ravitch, M. M.: Operative Treatment of Pectus Excavatum, Ann. Surg. 129:429-444 (April) 1949; (*b*) Pectus Excavatum and Heart Failure, Surgery 30:178-194 (July) 1951.

4. (*a*) Holmes, C. L.: Pectus Excavatum, J. Thoracic Surg. 33:321-329 (March) 1957. (*b*) Rehbein, F., and Wernicke, H. H.: Operative Treatment of Funnel Chest, Arch. Dis. Childhood 32:5-8 (Feb.) 1957.

5. Daniel, R. A., Jr.: Surgical Treatment of Pectus Excavatum, J. Thoracic Surg. 35:719-725 (June) 1958.

6. Baronofsky, I. D.: Technique for Correction of Pectus Excavatum, Surgery 42:884-890 (Nov.) 1957.

ORGANIZATION SECTION

STATEMENT REGARDING H. R. 12738, 85TH CONGRESS, APPROPRIATION FOR MILITARY DEPENDENTS BEFORE SENATE COMMITTEE ON APPROPRIATIONS

I am Dr. Hugh H. Hussey of Washington, D. C., Dean of Georgetown University Medical School. I am appearing here today as a member of the Board of Trustees of the American Medical Association to discuss the medical care program for the dependents of members of the uniformed services. Since the inception of the program, I have been a member of the Department of Defense Dependents' Medical Care Advisory Committee.

As passed by the House of Representatives, Section 633 of H. R. 12738, 85th Congress, the Department of Defense appropriation bill contains a ceiling on expenditures which we feel could destroy the Medicare program. It appears from the printed Hearings of the House Appropriations Committee that the inclusion of this section was recommended in an effort to force the Defense Department to care for more dependents in military medical facilities where, the committee stated, the cost would be considerably less than in civilian facilities. Later in this testimony, we shall point out that it has not been established that military dependent medical care can be provided more reasonably than civilian care.

Officers in charge of Medicare have concluded that administering the program under the present language of the appropriations bill would be extremely difficult, if not impossible. In any event, they report that the inclusion of the section would necessitate many major reductions in the benefits now offered to the thousands of dependents who live too far away from military bases to be cared for in military facilities.

As developed in the hearings, before public law 569, 84th Congress, was enacted, 40% of dependents were not receiving any form of medical care provided by the government through the military program. Under the old program, therefore, there was a great disparity in the medical services being obtained by dependents of the members of the various uniformed services—indeed, even among dependents of members of the same service.

It was pointed out by representatives of the Department of Defense that this disparity in benefits contributed to the expensive and rapid turnover of trained personnel in the uniformed services. Recognizing this problem, Congress stated in public law 569 that "the purpose of this Act is to create and maintain high morale throughout the uniformed services by providing an improved and uniform program of medical care for members of the uniformed services and their dependents." This committee has been advised by the Department of Defense that, to date, public law 569 has achieved its purpose, and the Medicare program has brought about a definite improvement in the morale of all uniformed personnel, particularly those who are married.

With some exception the American Medical Association has been pleased, in general, with the way the Medicare program has progressed since it began. We believe the program has been successful, in large measure, because representatives of the armed forces and the medical profession have cooperated closely and because dependents of service personnel have been permitted to choose freely between military and civilian sources of medical care.

The total number of dependents cared for in both military and civilian programs showed an overall increase of 39% since the civilian program was enacted in 1956.

In the first 18 months of the program, less than half of the dependents were cared for in civilian facilities by private physicians. As reported in the House hearings, 43.6% of this group resided too far from a military facility; 14.9% required a type of care not available at the military facility; for 12.8% the military facility was inadequate or overcrowded; 5% required emergency care; the remaining preferred civilian facilities for diverse reasons, including those for whom civilian physicians or hospitals were more convenient.

The Department of Defense reported in the hearings before the House Appropriations Committee that of the dependents receiving care in civilian facilities, 41.4% were maternity cases, 9.5% gynecological conditions, and 22.2% involved tonsillectomies. The tonsillectomies performed included a very large backlog which existed when the program was first enacted.

This same report showed that maternity and gynecological cases, according to several analyses of the Medicare program, constituted the major element of cost and frequency of utilization of both military and civilian facilities.

On the question of comparative costs of medical care for dependents in uniformed services and civilian facilities, it has been claimed in the House Appropriations hearings and before this committee that medical costs in the civilian program are far greater than in the military. We know of no valid studies that have been made by the Department of Defense which accurately compare these costs. To our knowledge, the department has no cost accounting system which isolates the cost of medical care for the dependent patient, particularly the total overall costs of maternity and surgical care.

This committee's attention should be called to the fact that outpatient care is not authorized on the civilian side of the program except for emergencies and obstetrics, although outpatient care is authorized in military facilities. Hence the doctors' fees for surgery and deliveries, including preoperative and postoperative care, and all outpatient care for obstetrics are charged against the per diem cost for a few days in civilian hospitals. For example, a physician's delivery fee would be prorated against a four-day hospital stay, or $31 a day for physician's services alone; whereas, he may have cared for this patient for nine months and will follow up the case later in his office—all for one fee.

Obviously, when the Air Force states that it can provide care for additional dependents on the basis of $10 per day, and the Navy for $16, which we must interpret to mean chiefly for obstetrics and surgery, they are not including outpatient prenatal and postnatal and preoperative and postoperative costs in arriving at these cost figures. Indeed, last year, as a result of similar claims made by the military services before the Appropriations Committees, the Bureau of the Budget, in reference to the cost of medical care in military facilities, stated in a letter of June 11, 1957:

"The military hospital operating costs include only direct costs, omitting many items of expense which, for budget and management purposes, need not be included in a Federal cost reporting system. The rate of $27.50 per day established by the Bureau of the Budget for the purpose of reimbursement between appropriations when dependents of one service are provided care in another service's hospitals does not reflect the true hospitalization cost to the Government.

"At least the following items of expense need to be added to arrive at an approximation of the full cost: depreciation of buildings and fixed equipment; outpatient care incidental to hospitalization; maintenance of a centralized procurement and depot system; maintenance of training facilities directed to increasing proficiency of hospital personnel; and management and professional direction by headquarters' staffs. While the Government is in effect a self-insurer against property and liability damages, such expenses cannot be excluded from a computation of total cost of patient care."

The Budget Bureau letter went on to say:

"There should also be included the costs of fringe benefits provided personnel. Such benefits for military personnel include free life insurance, medical care for the serviceman and his dependents, noncontributory retirement, as well as a number of minor benefits which are not susceptible to cost analysis. The Government also contributes toward the retirement and life insurance of its civilian personnel. While we have included certain of the fringe benefits in our computations, you can appreciate our concern that their costs not be regarded as definitive.

"Working with limited information and conceding that cost analyses of these expenses are not maintained, we have estimated that the above components of hospital expense contribute the following approximate amounts to the cost per patient day of providing care for dependents in military hospitals: depreciation, $1.25; outpatient care, $3.00; supply overhead, 0.45; education and training, 0.85; headquarters overhead, 0.20; liability and property insurance, 0.20; fringe benefits—life insurance, medical and dental care, and retirement—1.70, 0.45, and 0.50, respectively; total, $8.60. If these costs were added to the $27.50 uniformed service reimbursement rate, the total expense would approximate $36."

At the meeting on May 9, 1958 of the Dependents' Medicare Advisory Committee to the Secretary of Defense, a representative of the Bureau of the Budget reported that a survey was being completed which would bring up to date the figures furnished last year. Since May, there has also been an additional cost factor to consider, based on the military and the civilian pay raises recently enacted which will affect the estimates for these costs for fiscal year 1959. These studies by the Bureau of the Budget have now been completed and indicate that the per diem cost for a dependent patient in military facilities will approximate $44. A copy of the Bureau of the Budget's letter of June 27, 1958 is attached for the committee's information. I will appreciate your making it a part of the record.

Whether or not the cost is higher in a civilian facility, and we do not feel that it is, the program nevertheless has done what the purely military medical program could not do—it has cared for those dependents not residing near a military installation, others not residing with their sponsors, and those residing where adequate military facilities are not available.

It has always been our belief that any Dependents' Medical Care Program in the armed services should allow the dependent a free choice of physician and hospital and should not be the basis for an expansion of military medical facilities. We have opposed such expansion of military medical facilities and military medical care activities because of the resulting necessity for the drafting of additional physicians under admittedly discriminatory legislation. In our opinion, if the present restrictions are retained in Section 633, both of these objectives would be defeated.

We feel that if the Congress sees fit to continue to provide, or to expand, medical care for the dependents of members of the armed forces, the services of civilian physicians and hospitals should be used wherever possible, to be paid for at prevailing rates, with provision for free choice of physicians. In our opinion, this is a sound, fair and workable position. It is one which has been tested and one which will benefit the service personnel

and their dependents, relieve the unnecessary strain on the military medical services, and aid in the orderly development of community medical services for all of the people.

If the restrictions now in the bill are retained, there will also be a serious effect on service morale. In this connection, it should be remembered that the Dependents' Medical Care Act was instituted less than two years ago by the Congress primarily to attract and keep valuable personnel in the armed forces by giving them one of the fringe benefits that make business and industrial careers attractive.

This program, which is in the nature of a fringe benefit, whose purpose is to maintain high morale in the uniformed services and to encourage more men to enter and remain in a military career, should not be reduced or eliminated. We believe, with Secretary Brucker and the Department of Defense, that the action in setting a limitation on obligations for civilian medical and hospital care for dependents could cause the eventual destruction of the Medicare program.

It does not seem to us to be in the interests of National Defense to destroy one program in order to save 30 million dollars, while, at the same time, provide a military pay raise program costing 600 million dollars when both programs have the same objective.

We recommend, therefore, that Section 633 be eliminated from the House Defense Appropriation bill.

Mr. Chairman, I thank you and the members of the subcommittee for the opportunity of appearing at this hearing.

ANNUAL MEETING, ATLANTIC CITY, JUNE 8-12, 1959

The Scientific Program for the Annual Meeting of the American Medical Association in Atlantic City, June 8-12, 1959, is rapidly taking shape. There will be a full week of lectures, panel discussions, symposiums, motion pictures, color television, and scientific exhibits.

The lecture program for each section of the Scientific Assembly is prepared by the secretary of the section. A prospective participant should communicate at an early date with the secretary of the section before which he wishes to read a paper. The deadline for submission of titles of papers is Dec. 15.

The Scientific Exhibit is arranged by the Council on Scientific Assembly in cooperation with the Representatives to the Scientific Exhibit from the sections. Application blanks for space may be obtained from the section representatives or from the Secretary of the Council on Scientific Assembly. The deadline for submission of application is Jan. 10, 1959, but applicants are urged to send in applications as early as possible before that time.

Application blanks for time on the motion picture program are available also and may be obtained from the Secretary, Council on Scientific Assembly. Films are subject to preview at the discretion of the Council. The deadline is Jan. 10, 1959.

Following are the addresses of the section secretaries and representatives to the Scientific Exhibit from the sections:

Anesthesiology

Secretary—Vincent J. Collins, M.D., New York University-Bellevue Medical Center, 550 First Ave., New York 16.

Exhibit Representative—Edwin L. Rushia, M.D., University Hospital, Augusta, Ga.

Dermatology

Secretary—Edward P. Cawley, M.D., University of Virginia Hospital, Charlottesville, Va.

Exhibit Representative—Stanley E. Huff, M.D., 636 Church St., Evanston, Ill.

Diseases of the Chest

Secretary—Burgess L. Gordon, M.D., The Lovelace Foundation, 4800 Gibson Blvd., S. E., Albuquerque, N. Mex.

Exhibit Representative—Edwin R. Levine, M.D., 111 N. Wabash Ave., Chicago 2.

Experimental Medicine and Therapeutics

Secretary—Elliot V. Newman, M.D., Vanderbilt University Hospital, Nashville 5, Tenn.

Exhibit Representative—Joseph F. Ross, M.D., Department of Nuclear Medicine and Radiation Biology, University of California School of Medicine, Los Angeles 24.

Gastroenterology and Proctology

Secretary—William H. Dearing, M.D., 200 First St., S. W., Rochester, Minn.

Exhibit Representatives—Willard H. Bernhoft, M.D., 2900 Main St., Buffalo 14, and George Gordon McHardy, M.D., 3636 St. Charles Ave., New Orleans 15.

General Practice

Secretary—E. I. Baumgartner, M.D., 25 Alder St., Oakland, Md.

Exhibit Representative—I. Phillips Frohman, M.D., 2924 Nichols Ave., S. E., Washington 20, D. C.

Internal Medicine

Secretary—Rudolph H. Kampmeier, M.D., Vanderbilt University School of Medicine, Nashville 5, Tenn.

Exhibit Representative—Henry T. Ricketts, M.D., 950 E. 59th St., Chicago 37.

Laryngology, Otology, and Rhinology

Secretary—Walter E. Heck, M.D., Stanford University Hospital, San Francisco 15.

Exhibit Representative—Walter H. Maloney, M.D., University Hospitals, 2065 Adelbert Rd., Cleveland 6.

Military Medicine

Secretary—Col. Charles H. Bramlitt, M.C., U. S. A. F., Directorate of Professional Services, Office of the Surgeon General, Washington 25, D. C.

Exhibit Representative—Capt. Robert V. Schultz, M.C., U. S. N., Bureau of Medicine and Surgery, Department of the Navy, Washington 25, D. C.

Nervous and Mental Diseases

Secretary—A. L. Sahs, M.D., University Hospitals, Iowa City.

Exhibit Representative—Benjamin Boshes, M.D., Northwestern University Medical School, 303 E. Chicago Ave., Chicago 11.

Obstetrics and Gynecology

Secretary—Keith P. Russell, M.D., 511 S. Bonnie Brae St., Los Angeles 57.

Exhibit Representative—Frederick H. Falls, M.D., 715 Lake St., Oak Park, Ill.

Ophthalmology

Secretary—Harold G. Scheie, M.D., 313 S. 17th St., Philadelphia 3.

Exhibit Representative—Frank W. Newell, M.D., 950 E. 59th St., Chicago 37.

Orthopedic Surgery

Secretary—Robert J. Joplin, M.D., 1180 Beacon St., Brookline 46, Mass.

Exhibit Representative—James I. Kendrick, M.D., 2020 E. 93rd St., Cleveland 6.

Pathology and Physiology

Secretary—Hugh A. Edmondson, M.D., 1200 N. State St., Los Angeles 33.

Exhibit Representative—Samuel A. Levinson, M.D., L. A. Weiss Memorial Hospital, 4646 N. Marine Dr., Chicago 40.

Pediatrics

Secretary—Arild E. Hansen, M.D., 812 Mechanic, Galveston, Texas.

Exhibit Representative—F. Thomas Mitchell, M.D., LeBonheur Children's Hospital, Memphis 5, Tenn.

Physical Medicine

Secretary—Earl C. Elkins, M.D., 200 First St., S. W., Rochester, Minn.

Exhibit Representative—Harold Dinken, M.D., 1756 Race St., Denver 6.

Preventive Medicine

Secretary—Frank Princi, M.D., University of Cincinnati College of Medicine, Cincinnati 19.

Exhibit Representative—Paul A. Davis, M.D., 633 E. Market St., Akron 4, Ohio.

Radiology

Secretary—Traian Leucutia, M.D., Harper Hospital, Detroit 1.

Exhibit Representative—Richard H. Chamberlain, M.D., 3400 Spruce St., Philadelphia 4.

Surgery, General and Abdominal

Secretary—Gustaf E. Lindskog, M.D., 333 Cedar St., New Haven 11, Conn.

Exhibit Representative—Julian Johnson, M.D., 3400 Spruce St., Philadelphia 4.

Urology

Secretary—Edward H. Ray, M.D., 203 W. Second St., Lexington, Ky.

Exhibit Representative—E. F. Poutasse, M.D., Cleveland Clinic, 2020 E. 93rd St., Cleveland 6.

NOMINATIONS FOR GENERAL PRACTITIONER AWARD

Nominations for the General Practitioner of the Year award should be submitted to the American Medical Association headquarters as soon as possible. The award winner is chosen from nominations made by the constituent societies. Final selection is made by a committee appointed by the Chairman of the Board of Trustees. The winner will be announced Dec. 2 at the opening session of the House of Delegates at the Minneapolis Clinical Session.

COUNCIL ON MEDICAL SERVICE

COMMITTEE ON MATERNAL AND CHILD CARE

Conference on Perinatal Mortality and Morbidity Study Programs.—On July 26 and 27, the Committee on Maternal and Child Care of the Council on Medical Service sponsored a conference to develop recommendations for a basic flexible program that may be used by state and county medical societies, state and local health departments, and individual hospitals in their efforts to reduce deaths and morbidity resulting from conditions of the perinatal period. Participating in the conference were representatives of the College of American Pathologists, the American College of Obstetricians and Gynecologists, the American Association for Maternal and Infant Health, the Children's Bureau, the Association of State Maternal and Child Health and Crippled Children Directors, the American Academy of General Practice, the American Academy of Pediatrics, the National Institute of Neurological Disease and Blindness and the Human Embryology and Development Study Section of the National Institutes of Health, the American Hospital Association, the American Society of Anesthesiologists, and the American Public Health Association.

The immediate objective of the conference was to develop a set of guides for perinatal study committees similar to those developed last year for maternal death study committees. Since perinatal study committees now exist in individual hospitals, on a city-county-wide basis, and on a statewide basis, one of the early tasks of the conference was to make certain that the guides would be suitable to the needs of all three. Some of the most difficult decisions to make had to do with terms, definitions, and the calculation of rates to be used in study programs involving perinatal mortality and morbidity.

During 1957 and early 1958 the Committee on Maternal and Child Care sponsored field studies of many statewide, citywide, and individual hospital perinatal mortality study programs. It also held two regional conferences, one in Philadelphia and the other in Chicago. With these as a background, and the conference July 26 and 27, the Committee hopes to complete its guides late this fall.

POSITIVE HEALTH PROGRAM FOR SENIOR CITIZENS

Proceedings Available.—Numerous requests have been received for copies of papers presented at the A. M. A. Planning Conference for Medical Society Action in the Field of Aging, held in Chicago, Sept. 13-14, 1958, as well as the "A. M. A.'s Positive Health Program for Senior Citizens." A full report on the Conference, including all addresses, and the Positive Health Program will be available about Nov. 20, 1958. Physicians desiring copies may send their requests to: Council on Medical Service, American Medical Association, 535 N. Dearborn, Chicago 10.

MEDICINE AND THE LAW

TAX DEDUCTION OF PROFESSIONAL ENTERTAINMENT EXPENSES

The Central Medical Society of Jackson, Miss., has received the following ruling from the District Director of the Internal Revenue Service in Jackson setting forth the most detailed statement regarding the deduction of physician's entertainment expenses that has come to the Law Department's attention.

Following is the answer to the questions in your letter of June 4, 1958, concerning the deductibility, for federal income tax purposes, of doctors' entertainment expenses. We have no objections to this information being passed along to other physicians.

1. A physician may deduct on his federal income tax return the costs of entertainment, provided he can establish to the satisfaction of the Internal Revenue Service, by appropriate evidence, that such expenses are ordinary and necessary business expenses and clearly related to the production of business income.

2. The amount of the deduction must be proved and its reasonableness determined. Once the amount is established, the deduction may be claimed when the doctor is able to show that the entertainment had a direct relationship to the conduct of his practice and can show the business benefit reasonably to be expected from the expenditure. The general statement that he hoped or expected to get referrals or patients as a result of the entertainment is not enough. If personal reasons predominate, the expenditure may not be deducted, even though there is some possibility of a business benefit. Except in the case of industrial physicians, entertainment of individuals who are not doctors will not ordinarily qualify because the possibility of benefits to be expected is so remote as to be negligible. In instances of the entertainment of patients, the same general rules apply as in the entertainment of other doctors, and the clear relationship of the expenditure to reasonably expected income must be shown. The same rules also apply to civic and other club dues.

Criteria to be used in establishing the deductibility of entertainment expenses include, but are not limited to, the following:

a. Specific purpose of entertainment. b. Nature of the practice of the doctor incurring the expenditure. c. Period of time the doctor has been in practice and the number of patients he already has. d. Percentage of his patients received as referrals. e. Names of individuals entertained and reason why additional income could reasonably be expected from each. f. Whether or not referrals were actually received from the doctors entertained and any indication of the effect of the entertainment on these referrals. g. Number of times individual doctors were entertained during the year, inasmuch as repeated entertainment indicates a personal motive. h. Whether or not other doctors in the same type practice in the locality have entertainment expenses.

We trust that the above will be helpful in clarifying this area of tax law and administration.

OPINIONS OF JUDICIAL COUNCIL

The Judicial Council has authorized the publication of the following opinions.

QUESTION: May I, as a patient's attending physician, discuss patient's history, diagnosis, treatment, prognosis, etc., with patient's attorney?

ANSWER: Yes, with the consent of the patient. The Principles of Medical Ethics recognize in Section 10 that the physician has obligations to society as a whole in addition to his obligations to his patient as an individual. In many instances, the peculiar knowledge and attainments of the physician are indispensable to patients or others in the administration of business and government and in the usual conduct of certain daily affairs. When this knowledge, acquired during the course of the physician-patient relationship, is necessary to enable the patient to obtain his just due the physician should make it available for patient's benefit under proper conditions. Discussion with or report to the patient's attorney may be proper and necessary in order for patient to perfect a claim. The attending physician may ethically discuss patient's history, etc. with the attorney providing, of course, patient has consented to the discussion.

QUESTION: We have just completed a new "medical arts" building to house a group of us who are practicing as individuals. We would like to have an "open house" for the public. Is this permissible?

ANSWER: Section 5 of the Principles proscribes the solicitation of patients. If the intent for having the "open house" is to solicit patients, even indirectly,

then it would be contrary to the Principles. If, however, motivation for holding open house stems from civic and natural pride in having made a contribution to the community and to medicine then the practice may not be objectionable. In the latter instance, the holding of an open house might have the effect of acquainting the citizens of the community with some of the improvements developed for better patient care, comfort, and convenience. It might tend to convince the public that there is no apathy on the part of doctors when it comes to improving all facets of medical care.

Before a physician or a group of physicians hold such an open house, however, it is incumbent on him or them to discuss the proposal with appropriate officers of the component medical society. Communities and customs differ. The local society must assess local custom and usage and insure that neither the dignity of medicine nor local custom and tradition are offended by any particular practice of doctors.

QUESTION: What does the statement in Section 7 of the Principles mean when it says drugs, remedies, and appliances may be supplied by the physician provided it is in the best interest of the patient?

ANSWER: It is the opinion of the Judicial Council that this language was adopted to permit both the practicing physician and the local medical societies to evaluate the many factual situations incident to prescribing and dispensing which are bound to arise in the practice of medicine. Under this language the doctor is permitted to exercise his own best judgment when caring for his patients. It is known that there will be situations when it is necessary or desirable for a physician to dispense or supply what he has prescribed. The Principles permit this to be done. On the other hand, this broad language provides a means by which a component medical society can inquire into the facts of a particular practice. The profession thus can act to prevent abuse of discretion and protect patients from exploitation. In essence this language means that a physician in the exercise of sound discretion may dispense "in the best interest of his patient"; it does not authorize him to dispense solely for his convenience or for the purpose of supplementing his income.

QUESTION: Is it ethical to have another doctor perform surgery on my patient without patient's knowledge and consent?

ANSWER: No. The Principles in Section 2 state that the principal objective of the medical profession is to render service to humanity with full respect for the dignity of man. To have another physician operate on one's patient without that patient's consent, and without his knowledge of the substitution, is a fraud and deceit and a violation of a basic ethical concept. The patient as a human being is entitled to choose his own physician and he should be permitted to acquiesce in or refuse to accept the substitution.

A statement, prepared by the Law Department, is reproduced here as being educational on this matter.

The surgeon's obligation to the patient requires him to perform the surgical operation: (1) within the scope of authority granted him by the consent to the operation; (2) in accordance with the terms of the contractual relationship; (3) with complete disclosure of all facts relevant to the need and the performance of the operation; and (4) to utilize his best skill in performing the operation.

It should be noted that it is the operating surgeon to whom the patient grants his consent to perform the operation. The patient is entitled to the services of the particular surgeon with whom he contracts. The surgeon in accepting the patient obligates himself to utilize his personal talents in the performance of the operation to the extent required by the agreement, creating the physician-patient relation. He cannot properly delegate to another the duties which he is required to perform personally.

Under the normal and customary arrangement with private patients, and with reference to the usual form of consent to operation, the surgeon is obligated to perform the operation himself, and he may use the services of assisting residents or other assisting surgeons to the extent that the operation reasonably requires the employment of such assistance. If a resident or other physician is to perform the operation under the guidance of the surgeon, it is necessary to make a full disclosure of this fact to the patient, and this should be evidenced by an appropriate statement contained in the consent.

If the surgeon employed merely assists the resident or other physician in performing the operation, it is the resident or other physician who becomes the operating surgeon. If the patient is not informed as to the identity of the operating surgeon, the situation is "ghost surgery."

An operating surgeon is construed to be a performing surgeon. As such his duties and responsibilities go beyond mere direction, supervision, guidance, or minor participation.

He is not employed merely to supervise the operation. He is employed to perform the operation. He can properly utilize the services of an assistant to assist him in the performance of the operation. But he is not performing the operation where his active participation consists of guidance or standby responsibilities in the case of an emergency.

QUESTION: Is it ethical to disclose history, diagnosis, prognosis, etc., during the physician-patient relationship concerning my patient to an insurance company's representative?

ANSWER: Yes, if patient has consented to the disclosure. As recognized in Section 10 of the Principles a physician's responsibilities to his patient are not limited to the actual practice of medicine. They also include the performance of some services ancillary to the practice of medicine. These services might include certification that patient was under the physician's care and comment on the diagnosis and therapy in the particular case.

MEDICAL NEWS

ARKANSAS

Dr. Paul Day Goes with Food and Drug Administration.—The U. S. Commissioner of Food and Drugs, George P. Larrick, has announced the appointment of Paul L. Day, Ph.D., head, department of biochemistry and assistant dean, Graduate School, University of Arkansas School of Medicine, Little Rock, as scientific director of the U. S. Food and Drug Administration. Dr. Day who has been with the University of Arkansas School of Medicine for 31 years, is the author of many research papers in biochemistry and nutrition, a member of the Biochemistry Committee, National Board of Medical Examiners, and of numerous scientific societies, boards, and committees. He will assume his new position with the Food and Drug Administration sometime before the first of the year.

Personal.—Dr. Philip P. Ellis has been appointed associate professor to head the ophthalmology division in the department of surgery at the University of Arkansas Medical Center, Little Rock. Dr. Ellis formerly was assistant professor of ophthalmology at the State University of Iowa, Iowa City. The department has been awarded a $25,000 grant from the National Institutes of Health to be used toward paying salaries of personnel in the newly-created division.

CALIFORNIA

Personal.—Jacob Yerushalmy, Ph.D., professor of biostatistics, School of Public Health, University of California School of Medicine, Berkeley-San Francisco, has been appointed to the National Advisory Neurological Diseases and Blindness Council for a four-year term, the Surgeon General, U. S. Public Health Service, has announced.

COLORADO

Conference on Staphylococcal Disease.—A regional conference on the control of staphylococcal disease sponsored by the U. S. Public Health Service and Colorado State Department of Public Health was held in Denver, Oct. 15. Representatives from the Departments of Public Health of Wyoming, Utah, Montana, Idaho, and Colorado, Denver Department of Health and Hospitals, University of Colorado Medical Center, state medical societies in the Rocky Mountain Region, personnel from the Communicable Disease Center, Atlanta, hospital associations, Denver Medical Society, the Veterinary Medical School of Colorado State University, nursing associations, and many hospitals, participated. The forenoon was spent in sizing up the problem and the afternoon in working committees aimed at what to do to solve this problem.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

CONNECTICUT

Personal.—Dr. Wilfred Bloomberg, of the Southern Regional Education Board staff, has accepted the post of commissioner of mental health for the state of Connecticut. He had been serving SREB temporarily as associate director for mental health. ——Dr. Seymour L. Lustman, formerly a clinical fellow in the Child Study Center, has been appointed associate professor in the department of psychiatry at Yale University School of Medicine, New Haven.——Dr. Denis Abelson, senior registrar and medical tutor at the Postgraduate Medical School in London, has been appointed assistant professor of preventive medicine at Yale University School of Medicine, New Haven. Dr. Abelson previously served at Yale as a research fellow in physiology.

DISTRICT OF COLUMBIA

Dr. Wolf to Head Department at Illinois.—The board of trustees of the University of Illinois College of Medicine, Chicago, has approved the appointment of Arnold V. Wolf, Ph.D., as head of the department of physiology at the College of Medicine, Chicago, effective Dec. 1. Dr. Wolf, presently chief, Renal Branch, Cardiovascular-Pulmonary Division, Walter Reed Army Institute of Research, will succeed Dr. George E. Wakerlin, who resigned to become medical director of the American Heart Association. Dr. Wolf for 10 years taught at Albany Medical College, New York. He is the author of many scientific publications and his book on the function of the kidney is said to be regarded as a classic. He is a charter member of the American Society for Artificial Internal Organs, and a member of the American Physiological Society and the American Association for the Advancement of Science.

ILLINOIS

Chicago

Alumni Seminar Day.—The University of Illinois Medical Alumni Seminar Day will be held Nov. 22 and all alumni of the College of Medicine are in-

vited. Speakers will include Dr. Granville A. Bennett, dean of the College of Medicine, and Dr. Carl A. Hedberg, president of the Medical Alumni Association. Two panel discussions are planned: "Blood Transfusions and Laboratory Aids in Diagnosis of Medicine Problems" and "Recent Advances in Surgery," which will be followed by question-and-answer periods. Seminars will be conducted in the afternoon by the departments of medicine, surgery, pediatrics, and obstetrics and gynecology. The medical seminar is co-sponsored by the College of Medicine and the Medical Alumni Association. Dr. Louis R. Limarzi, associate professor of medicine, is program chairman.

Personal.—Martin C. E. Hanke, Ph.D., associate professor of biochemistry at the University of Chicago, has been appointed director of the Clinical Chemistry Laboratory at the university's medical and biological research center.——Dr. Otto C. Koluvek and Dr. Samuel C. Udell have been elected to the Board of Trustees of the Chicago Medical School. Both men are alumni of the School.

INDIANA

Personal.—Dr. John L. Reck, of Sheridan, was honored recently with an open house and reception sponsored by Sheridan service clubs and merchants. He completed 50 years as a practicing physician in June. In 1955 Dr. Reck was the recipient of the first annual "Outstanding Citizen" award, given by the Sheridan Rotary Club.——Dr. Frank E. Wiedemann, Terre Haute, marked his 64th year of practice by cancelling all medical indebtedness on his books. He has done this several times in the past, the last time in 1956.

KANSAS

Society News.—New officers of the Kansas Society of Pathologists are: Dr. Leo P. Cawley, Wichita, president; Dr. Tom R. Hamilton, Kansas City, Kan., vice-president; Dr. William J. Reals, Wichita, secretary-treasurer and Councilor to the American Society of Clinical Pathologists; Dr. Richard F. Looker, Wichita, alternate councilor.

MARYLAND

Personal.—Dr. Isadore Kaplan has been named medical director of the Baltimore and Ohio Railroad Company, with system jurisdiction at Baltimore to succeed Dr. Samuel M. English, who retired July 1. Dr. Kaplan joined the B & O's medical department in January, 1946.——Dr. Russell A. Nelson, director of the Johns Hopkins Hospital, Baltimore, has been named president-elect of the American Hospital Association.

MASSACHUSETTS

Boston University Grants.—The Department of Health, Education and Welfare, has made the following grants: $30,186 to Dr. Henry J. Bakst, Brookline, professor of preventive medicine, Boston University School of Medicine, for program expansion in rehabilitation training in medicine. Brenton R. Lutz, Ph.D., Melrose, professor emeritus of biology, $22,982 to continue his research on the reaction of blood vessels to chronic high blood pressure. I. Alden Macchi, Ph.D., Newton Upper Falls, assistant professor of biology, $9,813 to continue his study of adrenal hormones. Walter J. Gensler, Ph.D., Belmont, professor of chemistry, $8,400 to investigate the possible use of an extract of tree resin in the treatment of cancer.

Personal.—Dr. Harry Blotner, Boston, has been appointed visiting research professor of science at Nasson College, Springvale, Maine.

MICHIGAN

"Visiting Chief Day" at Sinai Hospital.—At Sinai Hospital of Detroit on Nov. 5, the visiting Chief was Dr. Edward B. Solomons, professor of obstetrics and gynecology, State University of New York College of Medicine at New York City, Brooklyn, and formerly of Rotunda Hospital, Dublin, Ireland. The program consisted of a clinical conference at 10 a. m., and a motion picture and discussion on the Manchester operation at 1 p. m.

State Medical Election.—At the 93rd annual meeting of the Michigan State Medical Society in Detroit, held Oct. 4, the following new officers were elected: incoming president, Dr. Gilbert B. Saltonstall, of Charlevoix; president-elect, Dr. Milton A. Darling, of Detroit; speaker, Dr. Kenneth H. Johnson, of Lansing; and delegates to the American Medical Association for two-year terms, Drs. Wyman D. Barrett and Robert L. Novy, Detroit, and George W. Slagle, Battle Creek.

Michigan's Hearing Conservation Program.—In its 15th anniversary report on the state-local hearing conservation program, the Michigan Department of Health notes that group tests to find previously undetected cases of hearing loss have been given to 2,052,942 Michigan school children since 1943. In the present year the 60 locally employed technicians working in all parts of the state will screen about 350,000 children. Group technicians are paid by the school, local health departments, and other local organizations. The announcement said that of every 10,000 children given group screening, 50 to 75 are found to have losses that handicap or can't be corrected medically. The Michigan Department of

Health helps provide consultant services for children who may be given hearing aids, special training, or referred to the Michigan School for the Deaf, where they are taught how to use the hearing aid. The state, since 1947, has purchased 463 hearing aids for medically indigent children.

MINNESOTA

Personal.—Dr. Jurgen Aschoff, professor of physiology, Max Planck Institute at Heidelberg, Germany, conducted a seminar on "The Measurement of Blood Flow by Thermal Conductance" Sept. 19 at the Mayo Foundation, Rochester.——Dr. Howard B. Burchell, Rochester, has been appointed to the National Advisory Heart Council for a four-year term, the Surgeon General, U. S. Public Health Service, has announced.—Dr. Howard B. Burchell, professor of medicine in the Mayo Foundation, Graduate School, University of Minnesota, has been appointed to a 4-year term, beginning Oct. 1, as a member of the National Advisory Heart Council.——Dr. Archibald I. S. MacPherson, of the University of Edinburgh, Scotland, lectured at the Mayo Clinic, Rochester, October 13, on "Portal Hypertension and Its Treatment," and Dr. Joseph H. Boyes, of the University of Southern California School of Medicine at Los Angeles, conducted a seminar at the Clinic, October 10, on "Tendon Grafts in the Fingers and Thumb."

MONTANA

Society News.—At the annual meeting of the Montana Chapter of the American Academy of General Practice, Dr. Amos R. Little Jr., Helena, was elected president to succeed Dr. William E. Harris, Livingston. Dr. Philip D. Pallister, Boulder, was named vice-president and Dr. Harry R. Soltero, Billings, president-elect. Dr. Vernon D. Standish, Bigtimber, was re-elected secretary-treasurer.

NEVADA

Society News.—Officers of the American Academy of General Practice, Nevada Chapter, elected for 1958-1959 are: Drs. Robert V. Broadbent, Reno, president; Dennis Cunningham, Las Vegas, president-elect; and Richard C. Sheretz, Reno, secretary-treasurer. The 1959 meeting will be held in Reno in June and members of the staff of the Medical School of the University of Southern California, Los Angeles, will organize and present the program.

NEW YORK

The Harrington Lecture.—The University of Buffalo School of Medicine presented the Harrington Lecture Oct. 30. The lecturer was Dr. Robert A. McCance, professor of experimental medicine, University of Cambridge, England, whose subject was "Calories."

Dr. Hilleboe Honored.—The University of Buffalo School of Medicine on Oct. 18 awarded Dr. Herman E. Hilleboe, state health commissioner, a citation as "an outstanding protector of public health, both in America and abroad." The citation further read "we are particularly grateful to him for his interest and cooperation with the University of Buffalo School of Medicine, particularly for assistance in developing the Chronic Disease Research Institute and for his outstanding work with the Roswell Park Memorial Institute."

Personal.—Dr. Julius S. Prince, health officer of the Jamestown District Office, New York State Department of Health, is scheduled to leave this fall for a two-year tour of duty in Ethiopia as chief of the Health Division for the International Cooperation Administration.

New York City

Conference on Tuberculosis.—The Council of the Tuberculosis and Health Associations of Greater New York will hold a Conference on Tuberculosis: A World-Wide Problem, in the Biltmore Hotel Nov. 18, 3 p. m. Dr. Georges J. Canetti, chief of laboratories, Pasteur Institute, Paris, France, will speak on "Changes in the Nature of Tuberculosis from the Standpoint of Pathology"; Dr. Leona Baumgartner, New York City commissioner of health, on "Urban Reservoirs of Tuberculosis"; and Dr. Stig Johannes Holm, Geneva, Switzerland, chief, Tuberculosis Section, WHO, on "How Can Elimination of Tuberculosis as a Public Health Problem Be Achieved?"

Increase in Deaths from Tuberculosis.—The municipal health department reports that the number of deaths in the five boroughs of New York City during the year ending last June 30 was 1,021, an increase of 4.1% beyond that of the previous 12-month period. The largest increase, 11.3%, was in Manhattan. The increase in deaths in Brooklyn was 9.2% and in the Bronx 3%. In Richmond there was a decrease of 11.8% in deaths from tuberculosis. According to the New York Tuberculosis and Health Association, 6,233 new cases of tuberculosis were reported during the year mentioned. The municipal department of health was said to have records of 10,852 known cases of active tuberculosis in New York City.

Dr. Ochoa Honored.—At a reception at the New York University–Bellevue Medical Center Oct. 20, Dr. Severo B. Ochoa, chairman, department of biochemistry, was guest of honor. Dr. Ochoa received the Borden award during the annual meeting of

the Association of American Medical Colleges in Philadelphia, Oct. 13. The award was based on his "isolation of the enzyme in crystalline form which catalyzes the condensation of oxaloacetic acid and acetyl coenzyme A to form citric acid and for his discovery and studies of polynucleotide phosphorylase." Dr. Ochoa, a graduate of the University of Madrid, Spain, has held faculty appointments at his alma mater; Oxford University Medical School, England; Kaiser-Wilhelm Institute for Medical Research, Heidelberg, Germany; and Washington University School of Medicine, St. Louis. He is a winner of the Neuberg Medal award in biochemistry, a past-president of the Harvey Society, and is a member of the National Academy of Sciences and the Council of the Society of Biological Chemists.

Affiliation of University and Institute.—New York University and the Institute for the Crippled and Disabled agreed on Sept. 25 to undertake joint efforts in rehabilitation research, teaching, and services to the handicapped. The documents of professional affiliation were signed before trustees and officers of the two institutions and distinguished guests, including Bernard Baruch, and Jeremiah Milbank, who founded the institute in 1917. The agreement, effective Nov. 1, among other things, is to provide all "types of service necessary for the handicapped to attain his fullest physical, social, and economic capability, and to undertake joint research into all areas of rehabilitation." The university and the institute will continue to function as financially independent, self-controlled institutions, and their rehabilitation activities will be coordinated through the university's recently created Center for Rehabilitation Services. The Institute for the Crippled and Disabled is an outpatient rehabilitation center whose services include medical treatment, social adjustment, and vocational training programs. It has facilities for making artificial limbs, a rehabilitation library said to be the largest of its kind, and it carries on research. The Institute will continue its joint efforts on specific projects with Columbia University, Presbyterian Hospital, and other institutions.

NORTH CAROLINA

Personal.—Dr. David R. Hawkins, associate professor of psychiatry University of North Carolina School of Medicine, Chapel Hill, has been appointed a member of the Mental Health Small Grant Committee of the National Institute of Mental Health for a term of four years.——By direction of the Secretary of the Air Force, Dr. Herbert A. Saltzman, who is now on the faculty of Duke University School of Medicine, Durham, has been awarded the Air Force Commendation Medal.

OHIO

University News.—Studies of the relationships between speech and personality characteristics which have been carried on for three years in the University of Cincinnati College of Medicine department of psychiatry will be continued with a three-year grant of $50,000 made to Dr. Louis A. Gottschalk, associate professor of psychiatry. The grant was awarded by the U. S. Public Health Service, which also subsidized the previous years of research.

OREGON

Personal.—Dr. J. V. Straumfjord, of Astoria, has been appointed by Governor Holmes of Oregon to the State Board of Medical Examiners to fill the vacancy created by the death of Wilmot C. Foster. Dr. Straumfjord from 1929 to 1934 was on the staff of the University of Oregon Medical School and from 1930 to 1934 was a staff member of the Dr. Robert C. Coffey Clinic and Hospital. He has been engaged in private practice in Astoria since 1934.

PENNSYLVANIA

Bockus Society of Gastroenterology.—The Bockus International Society of Gastroenterology has been organized by alumni of the Graduate School of Medicine of the University of Pennsylvania. Dr. James L. D. Roth, secretary-general of the society and associate professor of gastroenterology, said the establishment of the group was accomplished under the impetus of Dr. Figueiredo Mendes, of Rio de Janeiro, Brazil, an alumnus of the school, who was elected president of the new society, with Dr. Jose Maria De La Vega, Mexico City, president-elect. Dr. Henry L. Bockus, chairman, department of internal medicine, University of Pennsylvania Graduate School of Medicine, was made honorary president. The group will study geographical differences in behavior patterns and epidemiology of diseases in different parts of the world. Its annual meeting will be held just prior to that of the American Gastroenterological Association or in accordance with the International Congress of Gastroenterologists. At the first annual meeting in Philadelphia, June 3, 1959, work groups will be organized to undertake collaborative research on projects to be reported on at future meetings.

Philadelphia

University News.—A Health Research Facilities Grant of $46,038 to The Woman's Medical College of Pennsylvania has been approved by the U. S. Public Health Service to purchase scientific equipment for the college's 2 million dollar Research Wing to be constructed this fall. The new six-story addition will provide space for an expanded Department of Physiological Chemistry and for the

Basic Science and Clinical Departments. A federal grant of one-half million dollars to help meet its construction costs was awarded to the college this spring.

TENNESSEE

University News.—A $95,000 grant to finance the study of the effects of exposure to relatively low amounts of radiation on bodily function has been awarded by the Surgeon General's Office, Department of the Army, to two investigators at the University of Tennessee College of Medicine. They are Richard R. Overman, Ph.D., director, Clinical Physiological Laboratories, and Dr. David S. Carroll, professor of radiology.

TEXAS

Personal.—Dr. William P. Wilson, assistant professor of psychiatry and neurology, Duke University, has been appointed director of psychiatric research and as professor of psychiatry and neurology, University of Texas Medical Branch, Galveston.—— D. Bailey Calvin, Ph.D., formerly Dean of Students and Curricular Affairs, University of Texas Medical Branch, Galveston, has been made Director of the Office of Research Grants and Contracts.

VERMONT

University News.—Dr. George A. Wolf Jr., University of Vermont College of Medicine, Burlington, has returned from Iran, where at the request of the University of Teheran Medical School he served as consultant, concerning the curriculum, under the auspices of the International Cooperation Administration.——Dr. John H. Bland, associate professor of medicine, has begun a year of study at the University of Manchester, England, with Prof. J. H. Kellgren, director of the Rheumatic Center there. ——William H. Macmillan, Ph.D., assistant professor of pharmacology, is on a year's leave of absence from the University of Vermont College of Medicine, working in the laboratory of Prof. J. H. Burn at the University of Oxford, England. Dr. Wilhelm Raab, professor of experimental medicine, has returned from a year's work in laboratories of the medical clinic of the University of Innsbruck, Austria.

VIRGINIA

Society News.—Dr. W. Linwood Ball, of Richmond, was installed as the twelfth president of the Virginia Academy of General Practice May 10. Other officers elected were: Dr. Fletcher J. Wright Jr., Petersburg, president-elect; Dr. William J. Hagood Jr., of Clover, vice-president; Dr. Russell G. McAllister and Dr. William A. Young, both of Richmond, reelected to serve as secretary and treasurer, respectively; Dr. John O. Boyd Jr., of Roanoke, reelected A. A. G. P. delegate; Dr. Rufus Brittain, of Tazewell, his alternate.

WASHINGTON

Dr. McDonald Goes to New York.—Dr. Ronald F. McDonald, head, division of urology, University of Washington School of Medicine, Seattle, has moved to Rochester, N. Y., where he has been appointed professor and head of the University of Rochester's division of urology. Dr. McDonald came to Seattle in 1949 from the University of Chicago.

GENERAL

Grants for Research in Leukemia.—The Leukemia Society, Inc., has announced the availability of grants-in-aid for research projects concerned with the cause or cure of leukemia and allied diseases. Applications, which may be made at any time, are reviewed by the Selection Committee quarterly: March, June, September, and December.

Medical Writers' Meeting in Philadelphia.—The 1958 fall meeting of the Delaware Valley Chapter of the American Medical Writers' Association will be held Nov. 17, 8:30 p. m., at the College of Physicians, Philadelphia. Rudolf Flesch, Ph.D., will present the Wyeth Lectureship, "The Right Way to Medical Writing," and also will review various medical journals. All persons interested in improving communication in medicine are invited. Fee for dinner at 6 p. m. for members and guests is $5.

Association of Blood Banks.—The 11th annual meeting of the American Association of Blood Banks will be in Cincinnati, Ohio, November 20-22. A scientific program will comprise individual papers, panels, and technical workshops throughout the meeting. The administrative section of the program also will include panel discussions. At the annual banquet Friday evening, the guest speaker will be Robert Dechert, Assistant Secretary of Defense, Washington, D. C.

Society News.—Dr. Edward B. D. Neuhauser of Boston was made president-elect of the American Roentgen Ray Society at the recent 59th annual meeting in Washington, D. C. Other officers elected were: Drs. Franklin B. Bogart, Chattanooga, Tenn., first vice-president; Arthur B. Soule, Jr., Burlington, Vt., second vice-president; C. Allen Good, Rochester, Minn., secretary; and Robert K. Arbuckle, Oakland, Calif., treasurer. The next annual meeting will be in Cincinnati, Ohio, September 21-25, 1959.

Scholarships for Neuromuscular Studies.—The Sister Elizabeth Kenny Foundation has announced continuation of its program of post-doctoral schol-

arships to promote work on neuromuscular diseases. Each grant will provide a stipend for five years at the rate of $5,000 to $7,000 a year, depending on the scholar's qualifications. Candidates from medical schools in the United States and Canada are eligible. Inquiries should be addressed to: Dr. Edgar J. Huenekens, medical director, Sister Elizabeth Kenny Foundation, Inc., 2400 Foshay Tower, Minneapolis 2, Minn.

Meeting on Psychoanalysis.—The Academy of Psychoanalysis held its mid-winter meeting at the Roosevelt Hotel, New York City, Nov. 6-7, under the presidency of Dr. Jules H. Masserman, of Chicago. The title for the Saturday morning session was "Psychoanalysis Today, Its Goals and Aspirations," on which subject Dr. George J. Mohr, clinical professor of psychiatry, University of Southern California School of Medicine, Los Angeles, presented an essay which was followed by a discussion in five individual presentations. On Sunday morning seven individual speakers were presented and their papers were discussed Sunday afternoon.

American Rheumatism Association.—The Fifth Interim Scientific Session of the American Rheumatism Association will be held December 6 at the Mayo Clinic, Rochester, Minn., under the presidency of Dr. Joseph J. Bunim. The general subjects of the sessions beginning Saturday, 9 a. m., will be immunologic studies, clinical studies, miscellaneous studies. Chairman of the program committee is Dr. James B. Wyngaarden, Durham, N. C. The vice-chairmen in charge of the Interim Session are Drs. Gene H. Stollerman, Chicago; Hans Waine, Boston, Mass.; and Morris Ziff, New York City. The address at the banquet in the Kahler Hotel will be presented by Dr. Philip S. Hench of Rochester on "Walter Reed and the Conquest of Yellow Fever."

Foreign Virologists Visit U. S.—Eight virologists from as many lands began a nine-weeks polio study course when they arrived at the Pan American Sanitary Bureau, Regional Office for the Americas of the World Health Organization, Oct. 2. All are studying "Polio Diagnostic Techniques, and Vaccine Production and Control" under WHO's fellowships program. The fellows come from U. S. S. R., Chile, Egypt, Nigeria, Poland, Lebanon, Austria, and French Equatorial Africa. Their itinerary includes training and observation at the Communicable Disease Center laboratories in Montgomery and Atlanta, and the Institute of Microbiology Polio Laboratory in Montreal as well as a visit to three pharmaceutical companies producing polio vaccine in Detroit and Indianapolis.

United Cerebral Palsy.—The annual scientific session of United Cerebral Palsy, 321 W. 44th St., New York 36, will be at the Mayflower Hotel, Washington, D. C., November 15. The morning session will be given over to eight papers and discussions on "The Problem of Hemiplegia—A Critical Evaluation," under the aegis of the clinical advisory committee. The afternoon session will be a continuation of discussions on the same general subject. The meeting is open without charge to physicians, medical students and other professional workers in related fields concerned with cerebral palsy. The president of United Cerebral Palsy is Roger S. Firestone, president of Firestone Plastics Company, and the executive vice-president, Stanley C. Hope, president of Esso Standard Oil Company.

Awards to Medical Periodicals.—At its September meeting in Chicago, the American Medical Writers' Association announced the 1958 honor awards for distinguished service in medical journalism to the following periodicals: *Cleveland Clinic Quarterly*, published by the Cleveland Clinic; *Harper Hospital Bulletin*, published by the Harper Hospital, Detroit; *The Bulletin of the Fulton County Medical Society*, Atlanta, Ga. (award for periodicals of county or city medical societies with a membership of 500 or more); *The Medical Record*, published by the Berks County Medical Society, Reading, Pa. (award for periodicals of county and city medical societies with a membership of less than 500). The awards are presented annually "for accuracy, clarity, conciseness and newness of information; for excellence of design, printing and illustrations."

Western Surgical Association.—The 66th annual meeting of the Western Surgical Association will be in Rochester, Minn., Nov. 20-22, with headquarters at the Hotel Kahler. At a pre-conference session Wednesday afternoon and evening, eight short papers will be presented by members of the Mayo Clinic staff. The clinico-pathologic conference will be at 7:30, and at 8:15 a regular meeting of the clinic staff especially arranged for this session. On Thursday beginning at 7:30 a. m. a chest conference will be followed by surgical clinics, and later surgical movies. In the afternoon 10 papers will be presented and on Friday 10 more and the presidential address by Dr. James B. Brown, St. Louis, on "Examples of the Inspiring Challenge to Medicine in Literature Through the Ages." Eight additional papers will be presented on Saturday.

Award for Essay on Thyroid Gland.—The American Goiter Association has again announced the offering of the Van Meter Prize Award of $300 and two honorable mentions for the best essays submitted concerning original work on problems related to the thyroid gland. The award will be made at the annual meeting of the association to be held in the Drake Hotel, Chicago, April 30-May 2, 1959. The competing essays may cover either clinical or research investigations, should not exceed 3,000

words, and must be in English. Duplicate typewritten copies, double spaced, should be sent to the Secretary, Dr. John C. McClintock, 149½ Washington Ave., Albany 10, N. Y., not later than Jan. 15, 1959. A place will be reserved on the program of the annual meeting for the presentation of the winning essay by the author.

Fellowships in Radiological Physics.—The Atomic Energy Commission is accepting applications for fellowships in radiological physics, which provide qualified graduate students with nine months of regular university graduate work in the sciences with three months of field training at an AEC installation. The assignments are made for study at Vanderbilt University, Nashville, Tenn., with field training at the Oak Ridge National Laboratory; at the University of Rochester (N. Y.) and Brookhaven National Laboratory; and at the University of Kansas, Kansas City, or the University of Washington, Seattle, and the Hanford Atomic Products Operation. The basic stipend is $2,500 a year plus $350 for each dependent. Tuition fees, and travel allowance are included under the fellowships. The Oak Ridge Institute of Nuclear Studies, P. O. Box 117, Oak Ridge, Tenn., administers these fellowships for the AEC. The deadline for appointments that will take effect the following fall is Jan. 2, 1959.

Society News.—The **American Association for the Study of Neoplastic Diseases** (the original Bloodgood group of Johns Hopkins Hospital, organized in 1930) at its meeting in Gatlinburg, Tenn., elected Dr. Victor Levine, Chicago, president, and Dr. William E. G. Bayley, Lafayette, Ind., vice-president. The next meeting also will be in Gatlinburg, April 30-May 4, 1959, to which all physicians interested in the study of tumors are invited. Microscopes are used during the sessions. Gatlinburg is the headquarters of the Great Smoky Mountains National Park.—At the annual meeting of the **American College of Gastroenterology,** Oct. 19, in New Orleans, Dr. Frank J. Borrelli of New York, president-elect, assumed the presidency and Dr. Joseph Shaiken, Milwaukee, Wis., was chosen as president-elect. Other officers elected were: vice-presidents, Drs. Henry Baker, Boston; Louis Ochs Jr., New Orleans; Edward J. Krol, Chicago; and Theodore S. Heineken, Glen Ridge, N. J.; and Dr. Joseph R. Van Dyne, Forest Hills, N. Y., secretary.

Meeting of Speech and Hearing Association.—The 34th annual convention of the American Speech and Hearing Association will be at the Hotel New Yorker, New York City, on November 17-19. Among the subjects of the sessions will be a symposium on "Recoveries from Aphasia," "Cerebral Palsy," "Stuttering," "Audiologic Evaluation of Middle Ear Surgery," "Current Research on Hearing Aids," "Organic Disorders Affecting Voice and Articulation," "Cleft Palate," "Language Development of the Deaf Child," and "Planning and Design of Modern Clinical and Research Facilities." There will be alumni luncheons, open house, cocktail hour and dance Tuesday evening, and scientific and commercial exhibits.

On November 20 at the Hotel New Yorker there will be a conference on "Research Needs in Speech Pathology and Audiology," sponsored by the American Speech and Hearing Association in cooperation with the U. S. Office of Vocational Rehabilitation and Veterans Administration.

Influenza on Okinawa and in Oregon.—In its Oct. 17 *Morbidity and Mortality Weekly Report,* the U. S. Public Health Service reported that the Division of Preventive Medicine, Bureau of Medicine and Surgery, U. S. Department of the Navy, had received information regarding the occurrence of influenza in military personnel stationed on Okinawa. The outbreak which occurred about the middle of September involved men of four different companies. In two companies 5 men each were ill; 12 in another, and 31 in the fourth company. The main complaints were fever, headache, and dizziness. A few had "chest colds" and headache. The men returned to duty by the fifth day. There were no complications. A virus was isolated which was reported to be closely related to and probably identical with the Jap/305 strain of influenza type A.

The Oregon State Board of Health reports that the incidence of influenza continues to increase. Some serologic evidence of influenza A infection has been obtained, but the type of virus has not been definitely identified as yet.

Academy of Dermatology and Syphilology.—The 17th annual meeting of the American Academy of Dermatology and Syphilology will be at the Palmer House, Chicago, December 6-11. The annual meeting will include, as in other years, special courses, symposiums, panels, informal discussion groups, luncheons, dinners, and executive sessions, and committee meetings. Among the special events will be the first of the James R. Webster Memorial Lectures honoring the late president of the academy who passed away while in office last February. The lecture on Sunday afternoon will be delivered by Dr. G. A. Grant Peterkin, of the University of Edinburgh, Scotland, whose subject will be "The Changing Pattern of Dermatology." The subjects of other special lectures will be radiation and cancer. Dr. Howard B. Latourette, Ann Arbor, Michigan, will discuss "Radiation Hazards" and Dr. Anthony Cipollaro, New York City, "Current Trends in Cutaneous Radiation Therapy." The Women's Hospitality Committee has arranged special activities for the ladies including a sight-seeing tour, climaxed by luncheon in Chinatown, and a fashion show at the Congress Hotel.

Prevalence of Poliomyelitis.—According to the National Office of Vital Statistics, the following number of reported cases of poliomyelitis occurred in the United States, its territories and possessions in the weeks ended as indicated:

Area	Oct. 18, 1958 Paralytic Type	Oct. 18, 1958 Total Cases	Oct. 19, 1957 Total
New England States			
Maine	..	..	..
New Hampshire	..	..	..
Vermont	..	..	..
Massachusetts	..	..	1
Rhode Island	..	..	..
Connecticut	2	2	1
Middle Atlantic States			
New York	12	15	6
New Jersey	2	9	3
Pennsylvania	4	4	2
East North Central States			
Ohio	10	36	9
Indiana	3	8	5
Illinois	5	9	7
Michigan	30	66	15
Wisconsin	2	3	..
West North Central States			
Minnesota	3	3	1
Iowa	..	..	..
Missouri	3	6	1
North Dakota	..	1	..
South Dakota	..	..	..
Nebraska	..	2	..
Kansas	..	3	3
South Atlantic States			
Delaware	1	3	..
Maryland	3	3	3
District of Columbia	..	..	2
Virginia	10	11	5
West Virginia	7	10	2
North Carolina	1	4	3
South Carolina	1	1	..
Georgia	..	..	2
Florida	1	9	..
East South Central States			
Kentucky	1	2	3
Tennessee	4	8	5
Alabama	1	2	..
Mississippi	5	11	2
West South Central States			
Arkansas	1	1	..
Louisiana	3	4	4
Oklahoma	2	2	1
Texas	13	19	4
Mountain States			
Montana	..	..	..
Idaho	..	..	..
Wyoming	..	..	..
Colorado	..	..	2
New Mexico	..	2	1
Arizona	..	..	1
Utah	1	1	..
Nevada	..	..	..
Pacific States			
Washington	..	5	..
Oregon	..	1	..
California	19	23	17
Territories and Possessions			
Alaska	..	..	..
Hawaii	2	2	..
Puerto Rico	1	1	..
Total	143	292	111

LATIN AMERICA

Symposium on Cardiovascular Diseases.—An International Symposium on Cardiovascular Diseases will be held at Bogota, Colombia, South America, July 27-30, 1959, in which cardiologists from England, France, Sweden, Mexico, Cuba, and the United States will participate. The moderators of the several panels will be Drs. Adolfo De Francisco, Fernando Valencia, Alberto Castellanos, Jose Felix Patino, Alfonso Bonilla Naar, Miguel Trias, and Guillermo Rueda Montana. Among those from the United States scheduled to participate are Drs. Henry Swan II, Denver; John Maxwell Chamberlain, Mary Allen Engle, Charles E. Kossman, Joseph V. Brumlik, and Israel Steinberg, New York City; Richard J. Bing, St. Louis; Donald B. Effler, Cleveland; C. Walton Lillehei, Minneapolis; Michael E. DeBakey, Houston; Conrad R. Lam, Detroit; Dwight E. Harken, Robert E. Gross, and Alexander S. Nadas, Boston; Robert P. Glover, Philadelphia; Charles A. Hufnagel, Washington, D. C.; Francisco A. Hernandez, Miami; Frank L. Gerbode, San Francisco, and William W. L. Glenn, New Haven, Conn. Information may be obtained from Dr. Alberto Vejarano Laverde, Fundacion A. Shaio, Cra. 13, No. 43-23, Bogota, Colombia, South America.

CORRECTION

Medical Literature Abstracts.—In the paragraph on Medical Literature Abstracts on page 1040 of THE JOURNAL, Oct. 25, 1958 issue, the line which starts "Approximately two-thirds . . ." should have read "Approximately two-thirds of the abstracts from foreign literature are made from foreign language journals and one-third from publications of the British Commonwealth."

EXAMINATIONS AND LICENSURE

NATIONAL BOARD OF MEDICAL EXAMINERS

National Board of Medical Examiners: Part II only, April 21-22; Parts I and II, June 16-17; Part I only, Sept. 9-10. Examinations must be received at least six weeks in advance of a specific examination date. Examining centers established after close of registration. Exec. Sec., Dr. John P. Hubbard, 133 South 36th St., Philadelphia 4.

EDUCATIONAL COUNCIL FOR FOREIGN MEDICAL GRADUATES, INC.

Educational Council for Foreign Medical Graduates, Inc.: Stations around the world, Feb. 17. Deadline for foreign applications is Nov. 17. The following examination will be held Sept. 22 with application deadline of June 22. Exec. Director, Dr. Dean F. Smiley, 1710 Orrington Ave., Evanston, Ill.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: *Written.* Montgomery, June 16-18. Sec., Dr. D. G. Gill, State Office Bldg., Montgomery 4.

ARIZONA:* *Written Examination and Reciprocity.* Phoenix, Jan. 14-16. Sec., Dr. Thomas H. Bate, 2910 North 7th Ave., Phoenix.

ALASKA:* On application in Anchorage and Juneau. Sec., Dr. W. M. Whitehead, 172 South Franklin St., Juneau.

CALIFORNIA: *Oral Examination*, San Francisco, November 15. *Oral and Clinical Examination for Foreign Medical School Graduates*. San Francisco, June 15; Los Angeles, August 17; San Francisco, November 16. Sec., Dr. Louis E. Jones, 1020 N Street, Sacramento.

COLORADO: *Written*. Denver, Dec. 9-10. Exec. Sec., Mrs. Beulah H. Hudgens, 715 Republic Bldg., Denver 2.

CONNECTICUT:* *Homeopathic. Examination*. Derby, Jan. 13. Sec., Dr. Donald A. Davis, 38 Elizabeth St., Derby.

DELAWARE: *Written Examination and Endorsement*. Dover, Jan. 13-15, Jan. 22. Sec., Dr. Joseph S. McDaniel, Professional Bldg., Dover.

FLORIDA:* *Examination*. Miami Beach, Nov. 23-25. Sec., Dr. Homer L. Pearson, 901 N. W. 17th St., Miami 36.

GEORGIA: *Examination and Reciprocity*. Atlanta, June. Sec., Mr. C. L. Clifton, 224 State Capitol, Atlanta 3.

GUAM: *Subject to Call*. Act. Sec., Dr. F. L. Conklin, Agana.

IDAHO: *Examination and Endorsement*. Boise, Jan. 12-14. Sec., Mr. Armand L. Bird, 364 Sonna Bldg., Boise.

ILLINOIS: *Examination and Reciprocity*. Chicago, Jan. 26-30. Supt. of Registration, Mr. Fredric B. Selcke, Capitol Bldg., Springfield.

IOWA:* *Examination and Endorsement*. Des Moines, Dec. 8-10. Exec. Sec., Mr. Ronald V. Saf, State Office Bldg., Des Moines 19.

KENTUCKY: *Examination*. Louisville, Dec. 8-10. Sec., Dr. Russell E. Teague, 620 South Third St., Louisville 2.

MARYLAND: *Examination*. Baltimore, Dec. 9-11. Sec., Dr. Frank K. Morris, 1211 Cathedral St., Baltimore 1.

MASSACHUSETTS: *Examination*. Boston, Jan. 13-16. Sec., Dr. Robert C. Cochrane, State House, Room 37, Boston 33.

MONTANA: *Examination and Reciprocity*. Helena, April 7. Sec., Dr. Thomas L. Hawkins, 555 Fuller Ave., Helena.

NEBRASKA:* *Examination*. Omaha, June. Director, Mr. Husted K. Watson, Room 1009, State Capitol Bldg., Lincoln 9.

NEVADA:* *Examination and Reciprocity*. Reno, Dec. 2. Sec., Dr. George H. Ross, 112 North Curry St., Carson City.

NEW HAMPSHIRE: *Examination and Endorsement*. Concord, Mar. 11-14. Sec., Dr. Edw. W. Colby, 61 So. State St., Concord.

NEW YORK: *Examination*. Albany, Buffalo, New York and Syracuse, Dec. 2-5. Sec., Dr. Stiles D. Ezell, 23 S. Pearl St., Albany.

NORTH CAROLINA: *Reciprocity*. Southern Pines, Jan. 17. *Examination*. June. Asst. Sec., Mrs. Louise J. McNeill, 716 Professional Bldg., Raleigh.

NORTH DAKOTA: *Examination and Reciprocity*. Grand Forks, Jan. 7-10. Sec., Dr. C. J. Glaspel, Grafton.

OHIO: *Examination*. Columbus, Dec. 16-18. *Endorsement*. Columbus, Dec. 16-18. Sec., Dr. H. M. Platter, Wyandotte Bldg., Columbus 15.

OKLAHOMA:* *Examination*. Oklahoma City, June 2-3. Exec. Sec., Mrs. E. L. Haidek, 813 Braniff Bldg., Oklahoma City.

OREGON:* *Examination*. Portland, Jan. 6-7. *Reciprocity*. Portland, Jan. 8-10. Exec. Sec., Mr. Howard I. Bobbitt, 609 Failing Bldg., Portland 4.

PENNSYLVANIA: *Endorsement*. Harrisburg, Dec. 11-12. *Examination*. Philadelphia, Jan. 7-10. Sec., Mrs. Margaret G. Steiner, Box 911, Harrisburg.

RHODE ISLAND:* *Examination*. Providence, Jan. 8-9. Admin., Division of Professional Regulation, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH CAROLINA: *Endorsement*. Columbia, Dec. 9. Sec., Dr. H. E. Jervey, Jr., Blanding Bldg., Columbia.

SOUTH DAKOTA:* *Examination*. Sioux Falls, Jan. 20-21. Exec. Sec., Mr. John C. Foster, 300 First National Bank Bldg., Sioux Falls.

TENNESSEE:* *Examination*. Memphis, Dec. 17-18. Sec., Dr. H. W. Qualls, 1635 Exchange Bldg., Memphis 3.

TEXAS:* *Examination and Reciprocity*. Fort Worth, Dec. 4-6. Sec., Dr. M. H. Crabb, 1714 Medical Arts Building, Fort Worth 2.

UTAH: *Examination*. Salt Lake City, July 8-10. Dir., Mr. Frank E. Lees, 324 State Capitol Bldg., Salt Lake City 1.

VIRGINIA: *Examination and Reciprocity*. Richmond, Dec. 4-6. Address: Virginia Board of Medical Examiners, 631 First St., S. W., Roanoke.

WASHINGTON:* *Examination*. Seattle, Jan. 12-14. Sec., Mr. Thomas A. Carter, Capitol Bldg., Olympia.

WEST VIRGINIA: *Examination and Reciprocity*. Charleston, Jan. 5-7. Sec., Dr. Newman H. Dyer, State Office Bldg. No. 3, Charleston 5.

WISCONSIN:* *Examination and Reciprocity*. Madison, Jan. 13-15. Sec., Dr. Thomas W. Tormey, Jr., 1140 State Office Bldg., 1 West Wilson St., Madison.

WYOMING: *Examination and Reciprocity*. Cheyenne, Feb. 2. Sec., Dr. Franklin D. Yoder, State Office Bldg., Cheyenne.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA: *Examination*. Tucson, Dec. 16. Sec., Mr. Herman E. Bateman, University of Arizona, Tucson.

COLORADO: *Examination and Reciprocity*. Denver, Dec. 3-4. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver 18.

CONNECTICUT: *Examination*. New Haven, Feb. 14. Exec. Asst., Mrs. Regina G. Brown, 258 Bradley St., New Haven 10.

FLORIDA: *Examination*. Miami, June 6. Sec., Mr. M. W. Emmel, University of Florida, Box 340, Gainesville.

IOWA: *Examination*. Des Moines, Jan. 13. Sec., Dr. Elmer W. Hertel, Wartburg College, Waverly.

KANSAS: *Endorsement*. Kansas City, Jan. 14. *Examination*. Kansas City, Jan. 16-17. Sec., State Board of Healing Arts, Dr. F. J. Nash, New Brotherhood Bldg., Kansas City.

MICHIGAN: *Examination*. Ann Arbor and Detroit, Feb. 12-13. Sec., Mrs. Anne Baker, 116 Stevens T. Mason Bldg., West Michigan Ave., Lansing.

MINNESOTA: *Examination*. Minneapolis, Jan. 6-7. Sec., Dr. Raymond N. Bieter, 105 Millard Hall, University of Minnesota, Minneapolis 14.

NEW MEXICO: *Examination*. Santa Fe, Jan. 18. Sec., Mrs. Marguerite Cantrell, Box 1522, Santa Fe.

OKLAHOMA: *Examination*. Oklahoma City, Mar. 27-28. Exec. Sec., Mrs. L. Haidek, 813 Braniff Bldg., Oklahoma City.

OREGON: *Examination*. Portland, Dec. 6. Sec., Dr. Earl M. Pallett, Box 5175, Eugene.

RHODE ISLAND: *Examination*. Providence, Nov. 19. Admin. of Professional Regulation, 366 State Office Bldg., Providence.

SOUTH DAKOTA: *Examination*. Vermillion, Dec. 5-6. Sec., Dr. Gregg M. Evans, 310 East 15th St., Yankton.

TENNESSEE: *Examination*. Memphis, Dec. 31-Jan. 1. Sec., Dr. O. W. Hyman, 62 South Dunlap St., Memphis 3.

TEXAS: *Examination*. April 1959. Certificates issued by reciprocity and waiver on the first and fifteenth of each month. Sec., Bro. Raphael Wilson, 407 Perry-Brooks Bldg., Austin.

WASHINGTON: *Examination*. Seattle, Jan. 7-8. Sec., Mr. Thomas A. Carter, Capitol Bldg., Olympia.

WISCONSIN: *Examination*. Milwaukee, Dec. 6, Madison, Apr. 4. Sec., Dr. W. H. Barber, 621 Ransom St., Ripon.

---

*Basic Science Certificate required.

DEATHS

Auerbach, Julius Ⓜ Chicago; Chicago College of Medicine and Surgery, 1913; on the staff of the Walther Memorial Hospital; died while on a vacation in Sturgeon Bay, Wis., Sept. 27, aged 75.

Baldwin, Janet Sterling Ⓜ New York City; born in Lakewood, N. J., June 4, 1908; Johns Hopkins University School of Medicine, Baltimore, 1935; certified by the National Board of Medical Examiners; specialist certified by the American Board of Pediatrics; member of the American Pediatric Society and the American Academy of Pediatrics; associate professor of pediatrics at the New York University College of Medicine; member of the board of directors of the New York Heart Association; associated with the University, Bellevue, and Lenox Hill hospitals; died in the Presbyterian Hospital Sept. 17, aged 50, of cancer of the thyroid with cervical metastases.

Bender, Alva Jacob Ⓜ Salida, Colo.; Rush Medical College, Chicago, 1909; served on the faculty of his alma mater; a member of the board of education and county health officer; veteran of World War I; formerly on the staff of the Denver and Rio Grande Western Hospital, where he died Aug. 29, aged 83.

Bland, James Moncure, Boykins, Va.; Medical College of Virginia, Richmond, 1905; chairman of the Southampton County Board of Supervisors; killed Sept. 11, aged 76, in an automobile accident.

Bonnell, George Harrison Ⓜ Worthington, Ohio; Starling Medical College, Columbus, 1906; for many years member of the school board of which he was past-president; died Sept. 12, aged 77, of pulmonary emphysema.

Brown, William Lee Sr. Ⓜ Tucson, Ariz.; Rush Medical College, Chicago, 1916; formerly practiced in Chicago where he was associated with St. Luke's and Chicago Memorial hospitals; member of the Illinois State Medical Society; specialist certified by the American Board of Radiology; veteran of World War I; died in St. Mary's Hospital Sept. 10, aged 70.

Bullock, Norman Charles, La Jolla, Calif.; University of Illinois College of Medicine, Chicago, 1927; formerly practiced in Rockford, Ill., where he was health commissioner, past-president of the Winnebago County (Ill.) Medical Society and president of the board of trustees of the Rockford Municipal Tuberculosis Sanatorium; veteran of World War II; a member of the county health department; died in San Diego Aug. 31, aged 58, of pulmonary emphysema and cor pulmonale.

Burton, William Stone, Louisville, Ky.; Medical College of Virginia, Richmond, 1937; served as medical superintendent of the District Six Tuberculosis Hospital in Glasgow and on the staff of the W. T. Edwards Tuberculosis Hospital in Tallahassee, Fla.; consultant at the Hazlewood Sanatorium; died Aug. 15, aged 44, of cancer.

Crotty, Nora Ⓜ Cincinnati; Cincinnati College of Medicine and Surgery, 1902; four times elected vice-president of the Cincinnati Academy of Medicine; died Sept. 14, aged 88.

Davidson, Walter E. Ⓜ Liberty, Ill.; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1901; served as a member of the board of health of Adams County; died in the Blessing Hospital, Quincy, Sept. 2, aged 82.

Davis, William T. Ⓜ Scranton, Pa.; Medico-Chirurgical College of Philadelphia, 1911; past-president and secretary of the Lackawanna County Medical Society; served on the staff of the American Red Cross; formerly health director of Lackawanna County; at one time chief medical officer of the Lackawanna Railroad; formerly chief of medical service at Moses Taylor Hospital, where he died Sept. 23, aged 73.

Dillen, Oscar Marion, Lufkin, Texas; University of Tennessee College of Medicine, Memphis, 1915; veteran of World War I; on the staff of the Memorial Hospital and Angelina County Hospital, died Sept. 4, aged 72, of cerebrovascular accident.

Ferree, Arthur Cruzon Ⓜ Buena Park, Calif.; University of California School of Medicine, San Francisco, 1943; member of the American Academy of General Practice; veteran of World War II and served in France and Germany with the 6th Army as a battalion surgeon winning the Bronze Star for gallantry in directing evacuation of 275th Infantry wounded under fire; served on the staffs of St. Jude Hospital in Fullerton, St. Joseph Hospital in Orange, Santa Ana (Calif.) Community Hospital, Whittier Memorial and Carobil Hospital at Norwalk; died Sept. 4, aged 40, of myocardial infarction.

Finsterwald, Charles Frederick, San Antonio, Texas; Ohio State University College of Medicine, Columbus, 1916; died in Naples, Fla., July 28, aged 73, of coronary occlusion.

Ⓜ Indicates Member of the American Medical Association.

Fort, Chester Arthur Jr. ⊗ Jacksonville, Fla.; born in Ocala, Oct. 11, 1910; Tulane University School of Medicine, New Orleans, 1936; specialist certified by the American Board of Urology; member of the Southeastern Surgical Congress and the American Urological Association; fellow of the American College of Surgeons; formerly on the faculty of Emory University School of Medicine in Atlanta, Ga.; served during World War II; on the staffs of St. Vincent's, St. Luke's, Riverside and Brewster hospitals, and Duval Medical Center; died near Melrose Sept. 1, aged 47, while on a fishing trip.

Fulton, James Fairfax, Staunton, Va.; Medical College of Virginia, Richmond, 1919; member of the American Psychiatric Association; served as health officer; chief of the male service, Western State Hospital; died in the King's Daughters Hospital Sept. 5, aged 64, of myocardial infarction.

Galloway, Philip Lee, Glendale, Calif.; University of Kansas School of Medicine, Kansas City, 1944; veteran of World War II; on the staff of the Queen of Angels Hospital, Los Angeles; died Sept. 7, aged 38, of a heart attack.

Gazzolo, Louis Joseph ⊗ Chicago; Chicago Medical School, 1945; member of the Industrial Medical Association; formerly health officer with the Chicago Board of Health; veteran of the Korean War; associated with the Lewis A. Weiss Memorial Hospital and the Michael Reese Hospital, where he died Sept. 17, aged 45, of acute myocardial infarction.

Gilbert, William Paul ⊗ San Francisco; College of Medical Evangelists, Loma Linda and Los Angeles, 1937; certified by the National Board of Examiners; member of the American Academy of General Practice; died in the Mount Zion Hospital Aug. 7, aged 55, of coronary occlusion.

Graves, John William ⊗ Indianapolis; Indiana University School of Medicine, Indianapolis, 1927; veteran of World War II; for many years on the faculty of Indiana University School of Dentistry and taught for two years at the Indiana College of Mortuary Science; author of textbooks and laboratory manuals; died Sept. 6, aged 57.

Gunn, William Ussery, Clinton, S. C.; University of Louisville (Ky.) School of Medicine, 1949; clinical director at Whitten Village; died in the Self Memorial Hospital, Greenwood Sept. 16, aged 38, of atelectasis of lungs and bilateral and bronchopneumonia.

Hackler, John Fielden ⊗ Muskogee, Okla.; born in Tahlequah, Dec. 11, 1910; University of Oklahoma School of Medicine, Oklahoma City, 1933; specialist certified by the American Board of Preventive Medicine; entered the public health field Sept. 1, 1936 as director of the Payne County Health Department in Stillwater, Okla.; in 1940 became director of the field advisory staff of the Oklahoma State Board of Health, serving until 1943, and for 12 years served as chairman of the records committee; visiting lecturer in preventive medicine and public health and first full-time chairman and professor of preventive medicine and public health at his alma mater from 1943 to 1948, when he was appointed director of the city-county health unit; served as secretary of the Payne County Medical Society; charter member of the American Association of Public Health Physicians; was a member of the board of directors of the Oklahoma division of the American Cancer Society; for several years on the board of directors of the Oklahoma Congress of Parents and Teachers, serving as chairman of community health; author of articles in the field of preventive medicine and public health; died Sept. 3, aged 47, of rheumatic heart disease with aortic insufficiency and mitral stenosis.

Haines, Harold Grunder ⊗ Berlin, Pa.; University of Pittsburgh School of Medicine, 1920; associated with Somerset (Pa.) Community Hospital; president of the Berlin Lions Club; died Sept. 16, aged 63, of third degree burns received in a fire following an explosion in his home.

Hanson, Charles Joseph, Easthampton, Mass.; Baltimore Medical College, 1904; served as school physician, a member of the school committee, medical examiner for the Second Hampshire District, and as agent of the board of health; health officer of Easthampton; died in the Cooley Dickinson Hospital, Northampton, Aug. 31,aged 76.

Jennings, Edward Allen, New York City; Columbia University College of Physicians and Surgeons, New York City, 1913; member of the Medical Society of the State of New York; served on the staffs of the Harlem, Fordham, and St. Luke's hospitals; died Sept. 10, aged 76, of cerebral hemorrhage.

Kaplan, Murray M., Boston; Eastern University School of Medicine, Baltimore, 1913; died Sept. 5, aged 68.

Kiebala, Joseph Kasmer, Buffalo; University of Buffalo School of Medicine, 1913; member of the Medical Society of the State of New York; died Sept. 1, aged 66.

Lusher, Homer Virgil ⊗ Huntington, W. Va.; Medical College of Ohio, Cincinnati, 1906; died Sept. 12, aged 76.

McCandless, Orville Calnon ⊗ Cheyenne, Wyo.; Washington University School of Medicine, St. Louis, 1925; veteran of World War I; Laramie county health officer; served as health officer of Marion County, Kan.; died in the Veterans' Administration Hospital Sept. 12, aged 63, of coronary thrombosis.

McClure, Charles Richard ⑩ Portland, Ore.; Medical College of Ohio, Cincinnati, 1901; professor emeritus of orthopedic surgery at the University of Oregon Medical School; member of the American Academy of Orthopaedic Surgeons; fellow of the American College of Surgeons; for many years served as examiner for the Oregon Industrial Accident Commission; served on the staffs of the Doernbecher Memorial Hospital for Children, Multnomah County Hospital, and Shriners' Hospital for Crippled Children; died Sept. 4, aged 81.

McMeans, Joseph William ⑩ Anderson, S. C.; born in Toledo, Ohio, Jan. 25, 1891; University of Pittsburgh School of Medicine, 1912; specialist certified by the American Board of Pathology; member of the American Association of Pathologists and Bacteriologists, College of American Pathologists, and the American Society of Clinical Pathologists; fellow of the American College of Physicians; for many years practiced in Pittsburgh, where he was chief coroner's pathologist in Allegheny County, and served on the staff of Pittsburgh Hospital; formerly pathologist at the Allegheny Valley Hospital in Tarentum; pathologist at Anderson Memorial Hospital; died Sept. 2, aged 67, of dissecting aneurysm of the aorta.

Maley, Thomas Francis ⑩ Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1924; died Sept. 12, aged 60.

Martin, James Jackson, Dawson, Ga.; Atlanta College of Physicians and Surgeons, 1913; an associate member of the American Medical Association; veteran of World War I; died in the Patterson Hospital, Cuthbert, Aug. 30, aged 68.

Mintz, Maurice Emanuel, New York City; University and Bellevue Hospital Medical College, New York City, 1909; member of the Medical Society of the State of New York; specialist certified by the American Board of Obstetrics and Gynecology; fellow of the American College of Surgeons; on the staffs of the Mount Sinai Hospital and Sydenham Hospital; died Sept. 10, aged 72.

Murdoch, James Wilson ⑩ Chapel Hill, N. C.; University of Aberdeen Faculty of Medicine, Scotland, 1924; member of the American Psychiatric Association; served as medical superintendent of the North Carolina State Hospital in Butner; died in the Memorial Hospital Sept. 16, aged 58, of cerebral hemorrhage and hypertensive cardiovascular disease.

Myers, Roy Everett ⑩ Joplin, Mo.; National University of Arts and Sciences Medical Department, St. Louis, 1916; past-president of the Jasper County Medical Society; associated with Freeman Hospital and St. John's Hospital, where he died Sept. 4, aged 68, of coronary disease.

Nevitt, Orme Richardson ⑩ Raymond, Wash.; born in 1878; University of Minnesota College of Medicine and Surgery, Minneapolis, 1900; member of the American Academy of General Practice; past-president of the Pacific County Medical Society; helped organize the Pacific County Tuberculosis League of which he was president; served as health officer; in 1951 was named "Washington General Practitioner of the Year" by the state medical association; associated with the work of the American Red Cross for more than 50 years, serving many terms as county chapter chairman and was chairman emeritus at the time of his death; district registrar of vital statistics for many years; the Nevitt Memorial swimming pool, was built and dedicated in honor of his service to Raymond and the surrounding community; on the staff of the Willapa Harbor Hospital in South Bend, where he died Sept. 6, aged 79, of cancer.

Olms, Frank Albert, St. Petersburg, Fla.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1895; for many years practiced in Hampshire, Ill.; served on the staffs of the St. Joseph and Sherman hospitals in Elgin, Ill.; died Sept. 6, aged 83, of heart disease and pneumonia.

Pence, James William, Columbus Junction, Iowa; Keokuk Medical College, College of Physicians and Surgeons, 1907; served as medical examiner for the Rock Island Railroad; from 1941 to 1947 medical examiner for the Louisa County Draft Board; served as county coroner; died in the Bellevue Hospital, Muscatine, Aug. 30, aged 79, of diabetes mellitus.

Predmore, Donald Ford, Montrose, Calif.; College of Medical Evangelists, Loma Linda and Los Angeles, 1934; died Sept. 5, aged 50.

Prevor, Morris Aaron, Brooklyn; St. Louis University School of Medicine, 1929; member of the Medical Society of the State of New York; died in the Brooklyn State Hospital Aug. 14, aged 54, of cerebrovascular accident and arteriosclerosis.

Quattlebaum, Theodore Adolphus, Winnsboro, S. C.; Vanderbilt University School of Medicine, Nashville, Tenn., 1899; served as superintendent of the Carolina Orphan Home, Columbia, and the Croswell Home in Sumter; died in the Baptist Hospital, Columbia, Aug. 24, aged 82.

Reitz, Charles, Rochester, N. Y.; Bellevue Hospital Medical College, New York City, 1890; an associate member of the American Medical Association; on the staff of the Park Avenue Hospital; died Sept. 3, aged 91, of coronary occlusion.

Riley, James Horatio, Westport, Conn.; Starling-Ohio Medical College, Columbus, 1912; member of the Ohio State Medical Association; veteran of World War I; served on the staffs of the Mercy

and Springfield hospitals in Springfield, Ohio; died in Norwalk, Conn., Sept. 7, aged 69, of cerebral hemorrhage.

Schnaer, Carl Henry, Chicago; Chicago College of Medicine and Surgery, 1916; served on the staffs of the German Evangelical Deaconess Hospital and Englewood Hospital; died in the Veterans Administration Research Hospital Sept. 24, aged 73, of heart disease.

Schwarz, Francis Stenard Jr., ⊗ Cleveland; Cornell University Medical College, New York City, 1943; specialist certified by the American Board of Ophthalmology; member of the American Academy of Ophthalmology and Otolaryngology; formerly associated with the U. S. Public Health Service; on the staffs of the St. Vincent Charity and St. Luke's hospitals; died in Medina, Ohio, Aug. 31, aged 37, of injuries received in an automobile accident.

Sewell, Harry Dickey, Rochester, N. Y.; University of Pennsylvania Department of Medicine, Philadelphia, 1909; an associate member of the American Medical Association; fellow of the American College of Physicians; associated with the Veterans Administration; formerly member of the medical division of Eastman Kodak Company; died in the Veterans Administration Hospital, Boston, Aug. 25, aged 75, of cancer.

Sherer, William Walter, Los Angeles; University of Southern California College of Medicine, Los Angeles, 1906; died in the Parkview Hospital Aug. 29, aged 79, of cancer of the pancreas.

Shirk, Paul Kuhlmann, Watervliet, N. Y.; Jefferson Medical College of Philadelphia, 1930; formerly practiced in Yonkers, where he was on the staff of the St. John's Riverside Hospital; medical rating specialist and personnel physician at the Veterans Administration office at the Watervliet Arsenal; died Aug. 27, aged 64.

Soucek, Adolph ⊗ Madison, Wis.; State University of Iowa College of Medicine, Iowa City, 1931; specialist certified by the American Board of Psychiatry and Neurology; member of the American Psychiatric Association; served as assistant physician at the State Hospital and School, Woodward, Iowa, assistant superintendent of the Cherokee (Iowa) State Hospital, superintendent of the Mount Pleasant (Iowa) State Hospital, and assistant superintendent of the Mendota State Hospital; died Aug. 30, aged 51, of cryptococcosis.

Spain, A. L., ⊗ Letona, Ark. (licensed in Arkansas in 1903); died Aug. 23, aged 85.

Spratt, John Thomas ⊗ Mingus, Texas; Dallas Medical College, 1902; for many years surgeon for the Texas and Pacific Railway; died in Strawn (Texas) Hospital Sept. 3, aged 83, of third degree burns received while burning trash.

Stahl, Clare William, Topeka, Kan.; Kansas Medical College, Medical Department of Washburn College, Topeka, 1904; veteran of the Spanish-American War; died Aug. 31, aged 80, of cancer of the esophagus.

Styles, George Wilson, Miami, Fla.; Meharry Medical College, Nashville, Tenn., 1948; died June 4, aged 45, of cerebral hemorrhage, hypertension and arteriosclerosis.

Terflinger, Fred Weston ⊗ Logansport, Ind.; Medical College of Indiana, Indianapolis, 1902; veteran of World War I; served as superintendent of the Logansport State Hospital; a charter member and past-president of the Rotary Club; died in St. Joseph's Hospital Sept. 5, aged 84.

Treible, William Henry, St. Petersburg, Fla.; Jefferson Medical College of Philadelphia, 1896; an associate member of the American Medical Association; formerly practiced in York, Pa., where he was associated with the York Hospital; died Aug. 22, aged 92, of cerebral thrombosis.

Welsh, Arthur Brinkley ⊗ Colonel, U. S. Army, retired, Newton Square, Pa.; University of Pittsburgh School of Medicine, 1925; entered the medical corps of the U. S. Army July 12, 1926, and retired Oct. 31, 1954; awarded the Legion of Merit for conspicuous and meritorious service in the Army from November 1941 to May 1945; service member of the American Medical Association; died in Harrisburg Sept. 4, aged 57, of coronary occlusion.

Westrope, Gordon Robert ⊗ Columbia, S. C.; Medical College of South Carolina, Charleston, 1927; member of the American Psychiatric Association; veteran of World War I; formerly practiced in Gaffney, and served as district health director and director of the Cherokee County Health Department; for many years associated with the South Carolina State Hospital; died Aug. 25, aged 65.

Williams, Edwin Lacy, Fort Meade, Fla.; Atlanta College of Physicians and Surgeons, 1904; died June 1, aged 85, of arteriosclerotic heart disease and hypertension.

Williams, Paul Sinclair, Santa Cruz, Calif.; Western Reserve University School of Medicine, Cleveland, 1931; died Aug. 27, aged 52.

Wilson, Claude ⊗ Greenville, Ky.; University of Louisville (Ky.) Medical Department, 1910; veteran of World War I; on the staff of the Muhlenburg Community Hospital; died Aug. 21, aged 78.

Zachariah, Simon R., San Francisco; College of Physicians and Surgeons, San Francisco, 1900; served with the British Army during World War I; died Sept. 7, aged 80.

FOREIGN LETTERS

INDIA

Scurvy.—A. Chakravarty and co-workers (*Indian J. Child Health* 7:8 [Aug.] 1958) stated that while protein malnutrition, rickets, hypovitaminosis A and B, and anemia are common, the incidence of scurvy in India is believed to be low, but they observed 28 cases of scurvy in a period of 17 months. The number of patients diagnosed as having scurvy was much larger, but the diagnosis could not be confirmed because these patients were lost sight of. Most were boys, with the preponderance being between the ages 2 and 3 years, and the largest number of patients were seen between October and January. Most of them came from poor families, and their diet was deficient in calories and vitamins. The diet contained an insignificant quantity of pulses and milk, while fruits were uniformly absent. A history of a preceding illness was available in 21 patients, the most common being fever of undetermined origin and upper respiratory tract infection. The onset was acute in 24 and insidious in four.

The common clinical findings were tenderness over the lower limbs and pseudoparalysis with inability to bear weight. In eight the tenderness was severe enough to make the child cry when the limbs were touched. Pseudoparalysis was unilateral in nine. Most of the children were irritable. Mild to moderate anemia was present in almost all patients, but frank bleeding from the gums was found in only five. One girl of 6 years came to the hospital with generalized hemorrhages and pseudoparalysis, rapidly developed coma, and died, probably of a subarachnoid hemorrhage. There were no other deaths. Seven showed evidence of multiple vitamin deficiencies. A mild polymorphonuclear leukocytosis was seen in 14. Bone marrow biopsy was done in seven patients; six of these had a normoblastic and one a megaloblastic appearance. The Kahn test was done in two of those below the age of 2 years to rule out congenital syphilis and was found to be negative.

Radiologically, the commonest sign was the white line of Fränkel, associated with a zone of rarefaction below it. One patient had subperiosteal calcification. During the process of healing the Trummerfield's zone of rarefaction was the first to disappear, trabeculas appeared, and the effusion in the joints gradually diminished. The vitamin C content of the blood was estimated, and it was noticed that those with a content of less than 0.1 mg. per 100 ml. had frank hemorrhages. The highest level of vitamin C in the blood associated with the presence of bleeding gums was 0.22 mg. per 100 ml. In 18 a close correlation between the blood level of vitamin C and the severity of symptoms was noted. These patients were given 200 to 500 mg. of vitamin C daily by mouth, the dose depending on the severity of the condition. Diminution in tenderness, pain, and irritability was noticed within 72 hours, and full return to normal weight bearing was possible in early cases after 7 to 14 days of treatment. Two patients responded very slowly to therapy. The blood vitamin C level took about two weeks to show a rise and returned to normal within 3 to 12 weeks.

The items in these letters are contributed by regular correspondents in the various foreign countries.

NEW ZEALAND

Van Meter Prize.—Dr. Duncan D. Adams has been awarded the American Goiter Association's Van Meter prize. This prize is given annually for the best research on the thyroid gland anywhere in the world. Dr. Adams is on the staff of the endocrinology research unit of the New Zealand Medical Research Council. He gained the prize for his work in connection with toxic goiter. In collaboration with Dr. H. D. Purves he developed a method of detecting and measuring thyroid-stimulating hormones. Application of this method led to the discovery that patients suffering from the disease have an abnormal thyroid-stimulating hormone in their blood. The discovery has since been confirmed by American scientists. It has led to a new line of investigation which promised to reveal the basic cause of the disease.

Health Service Reviewed.—Dr. J. P. S. Jamieson (*Brit. M. J.* [supp.] 2:15 [July 5] 1958) reported that to understand the social security medical services in New Zealand it is necessary to review the system which existed before their introduction. Public hospitals, financed by local taxes, government subsidy, patients' fees, and voluntary contributions, and administered by local boards, served all parts. Most wage earners paid for themselves. The poor were assisted by hospital boards and relied largely on the benevolent services of the doctors. During the depression of the 1930's, it became evident that a greater participation by the state in health matters was inevitable. A committee was set up to examine the needs of the country and to in-

quire into the systems of other countries. The committee advised (1) a gradual introduction of the service and emphasized prevention of and research on diseases, (2) greater access to x-ray examination, laboratory and pathological investigation, and other costly procedures, (3) free service for those unable to pay for medical care, the cost to be borne by the state, (4) reduced costs for maternity care and hospitalization, and (5) insurance of those with smaller incomes against sickness in the home on a contributory-subsidized basis.

The government, however, inclined toward a universal revolutionary system, by which, in keeping with the ideology of state ownership and control, all medical service would be entirely under the government and all physicians would become virtually state employees. After various unacceptable proposals by the government, the New Zealand Branch of the British Medical Association considered a fee-for-service system at $1.10 for consultation or visit and $2 for consultation or visit at night and on Sundays and holidays and mileage for country visits. During World War II this became law. The branch saw in this the danger of the state interposing between patient and doctor and ultimate domination of the profession. At this point, the Prime Minister intervened with the proposal of an alternative to the fee-for-service claim on the fund by the general practitioner. He suggested that those who preferred might charge the patient himself such fees as he thought fit, and the patient could obtain, on presentation of his receipted account, a refund equal to the fee-for-service payment. By this method the state did not come between physician and patient, the patient-doctor relationship was preserved, and the physician would not be in any sense a government servant in his practice.

Provision was also made on a salary basis for the service of certain small isolated communities and for people living in scattered districts in which a physician ordinarily could not make a living. There are specialists on the staff of the free hospitals, and the patients of private specialists get the ordinary refund on their accounts for each attendance. Later, radiological, diagnostic, laboratory, and pathological services were established. Briefly, medical services are now available "free" to everyone from birth till death—"free," but paid for by taxation. The cost of the general practitioner, however, absorbs but a fraction more than 12 of the 18 cents social security tax. Medical service is efficient. People are living longer. Maternal mortality is one of the lowest in the world. Neonatal deaths have diminished. Rehabilitation for invalidism is quicker than it used to be. Doctors are fully employed and can practice wherever they choose. There are some weaknesses in the system; there is undue reference of patients to hospital for things the physician should do for himself; there is waste of drugs; and in some cases there is a tendency to exploit the fund by overattendance; but on the whole it is satisfactory.

NORWAY

Causes of Death.—When a woman of 70 with a history of rheumatic fever in childhood, angina pectoris in later years, and a possible infarct is found on examination to present a systolic murmur over the apex, a bundle-branch block on an electrocardiographic examination, marked systolic and diastolic hypertension, chronic bronchitis, and emphysema, how is her death certificate to be worded? With this and kindred problems in his mind, Prof. H. J. Ustvedt (*Tidsskrift for den norske lægeforening*, Sept. 1, 1958) set the staff of his side of Ullevaal Hospital the task of analyzing, in terms of death certificates, records of the 118 patients discharged in June, 1957. Half of this number were over the age of 60, and only 10% were under 40. None was under 20. Each of five members of his staff listed these patient's ailments independently of each other. In only 18 cases did they agree on which were the principal diseases and which were complications or accessory. In 32 cases there was a relative agreement, all being credited with the same diseases, but not necessarily in the same order of importance. By adding these 32 to the 18 already mentioned, it could be claimed that approximate agreement had been achieved in only 42% of the total. A substantial degree of disagreement was noted in particular with regard to atherosclerotic, rheumatic, hypertensive, and other forms of heart disease. Commenting on these findings, Ustvedt confessed that, far from solving any problem, they raise a whole series of questions, calling for uniformity of diagnostic criteria, uniformity of nomenclature, and some coordination within hospitals over material for statistical handling.

Rheumatic Fever.—Höst and Ustvedt (*Tidsskrift for den norske lægerforening*, Sept. 15, 1958) used a modification of the Duckett Jones system of criteria for the diagnosis of rheumatic fever in an attempt to ascertain what changes this disease may have undergone in the recent past. The 174 cases observed at Ullevaal Hospital in the three-year period 1931-1933 were compared with the 121 cases in the five-year period 1952-1956. The hospital records of each of these 295 cases was critically scrutinized with regard to the diagnostic criteria used. There was complete agreement with the Jones criteria in 86% of the first and 81% of the second group. In both groups it would thus seem that the diagnoses had, on the whole, reflected discriminating accuracy. To judge by this comparison the dis-

ease has shifted in character, with fewer severe cases with involvement of the heart and fewer relapses. While in the first group the sexes were equally represented, females predominated in the second group in the ratio of 3:2. Patients under 20 years of age were equally represented in the two groups, but whereas only 7% of the patients in the first group were over 50, this was the case with 27% in the second group. In a retrospect of earlier publications on the subject, it is pointed out that opinions as to the decline in the frequency and severity of rheumatic fever have been unavoidably vague for want of straightforward criteria which render a disease like pernicious anemia amenable to accurate diagnosis. At present, the closest approach to accuracy is by such a system of criteria as that used by Duckett Jones.

The State Institute of Public Health.—With its staff of 14 physicians, 8 pharmacists, and a budget running into many millions, the State Institute of Public Health in Oslo is now so much taken for granted that there is risk of the services it renders to the community being overlooked—hence the importance of its annual report for 1957 (supplement to *Tidsskrift for den norske lægeforening*, Aug. 15, 1958). Most of the bacterial vaccines, toxoids, and serums needed in Norway are produced by the institute's serum department. Those vaccines that have to be imported from abroad include that for poliomyelitis which is imported from Denmark and the United States and small quantities of certain typhus, plague, and yellow fever vaccines. The cowpox vaccine department is the sole producer of cowpox vaccine in Norway. Attempts are being made to reduce the bacterial content of the calf vaccine and to increase the stability of cowpox vaccine grown on tissue cultures. In 1957 a case of postvaccinal encephalitis with recovery was reported. There is also the bacteriological department which carries out bacteriologic and serologic tests. In 1957 there were 47,787 specimens examined for tubercle bacilli. The serodiagnosis department includes a Wassermann laboratory which in 1957 examined 83,741 specimens for the diagnosis of syphilis by complement fixation and flocculation tests. Another laboratory dealt with influenza problems, including those raised by the epidemic in the last four months of 1957. Another unit is the chemistry department which is concerned with chemical investigations of drinking water and sewage. In 1957 the methodology department was created. It deals with special problems in the fields of microbiology and biochemistry.

Shortage of Radiologists.—At the end of last year about 50% of the hospital posts for radiologists were vacant for want of applicants. This illustrates the working of the law of demand and supply, but it must be carefully explained to the public hospital authorities who have not hitherto fully appreciated what it costs to become a radiologist. As pointed out by Dr. O. Grönvik, chairman of the Junior Physicians Association, the physician who has graduated as such must take six to seven additional years in order to qualify as a fully trained radiologist, having under the best of circumstances to spend four of these years in the radiological department of a hospital. The health authorities have decided that the radiologist must not exceed a 40-hour week on account of the dangers inherent to his work, but in practice no Norwegian radiologist keeps within this limit, such is the call on his services. Even when a young radiologist becomes qualified for one of the relatively few high appointments, he may hesitate before accepting it for fear of finding himself swamped by work for which he has no assistant. Something could be done to encourage the recruiting of junior radiologists by allowing them certain emoluments hitherto denied them in certain hospitals. Although the practice of such hospitals to pay the surgeon called on to deal with a casualty brought to hospital but to pocket the corresponding fee charged the patient for the services of radiologist working in cooperation with the surgeon has led to disputes, it is not so much a matter of fees in isolated instances as the long-term future of the would-be radiologist that is making him hesitate in his choice of calling. Because it takes so long to become a radiologist, there is little prospect of the present stalemate being corrected in the near future.

SWITZERLAND

Iproniazid and Angina Pectoris.—Schweizer and von Panta (*Schweiz. med. Wchnschr.* **88**:822, 1958) gave 150 mg. a day of iproniazid to 100 ambulatory patients with angina pectoris for 12 to 222 days. The pain on effort disappeared in 48 patients and was improved in 49. In three the drug had no effect; 63 were completely and 29 partially relieved from pain at rest. Improvement was noted after an average of 7 (2 to 18) days. The optimal therapeutic effect was reached before the 20th day and remained constant during the trial period in 98 patients. After the drug had been discontinued, pain reappeared in 74 within 10 to 20 days. The electrocardiogram at rest remained unchanged in 57 patients; the ischemic changes decreased in 30 and increased in 13. The arterial pressure was diminished in 25% of the normotensive and in 73% of the hypertensive patients. In 40% there was an orthostatic hypotension. A decrease of the hypotensive effect of iproniazid during the trial period was observed in 36 patients. Serious complications oc-

curred in 14 patients: myocardial infarction in 4, cerebrovascular accident in 2, congestive heart failure in 4, urinary retention in 2, and psychosis in 2. Three patients died, two with myocardial infarction and one with cerebrovascular accident.

Such undesirable side-effects as impotence, insomnia, and constipation were observed in 89 patients. These side-effects made it necessary to cease the trial in 46. In most of these patients the drug had a marked effect on the pain. Unfortunately the side-effects prohibited the administration of an effective dosage over a prolonged period of time in about half the patients. In most, the effective dosage was 150 mg. a day. It cannot yet be stated whether or not a drug tolerance develops. There are no indications that iproniazid has any effect on the myocardial ischemia or on the natural course of the disease. On the other hand the disappearance of the signal pain has not been proved to be harmful. The danger of serious complications necessitates careful observation of the patient. In the presence of cerebral arteriosclerosis or of a marked increase of the size of the heart, the administration of iproniazid is not advisable.

UNITED KINGDOM

Public's Views on Cancer.—The public's views on the cause of cancer were obtained through interviews with a random sample of the adult population of Edinburgh by Cartwright and Martin (*Brit. M. J.* **2**:592, 1958). Only 1% of those questioned knew that cancer could attack children. Between 25 and 33% considered it primarily a disease of persons above the age of 45. There were no indications of cancerophobia in the population at large. When asked which of five selected causes of death was responsible for the greater number of deaths in the population, 35% said heart disease, 32% said traffic accidents, and 27% said cancer. Women were more cancer-conscious than men. Of those questioned, 75% thought that cancer was ultimately fatal, and more than 33% said that they would rather not know if they had cancer. It is now quite widely believed that smoking is a cause of cancer. When asked specifically, 30% said that smoking was a possible cause. The cause of cancer most frequently suggested was knocks, bumps, or bruises. Then in descending order of frequency came smoking, air pollution, inheritance, fatigue, worry, and "overstrain." No opinion on the cause of cancer was given by 34%, and 12% thought that it was communicable. Curiously enough, the number of people who gave up smoking on the grounds of expense was greater than those who gave it up for health reasons.

Psychological Medicine in General Practice.—A working party of the Council of the College of General Practitioners studied psychological medicine in general practice at the request of the Ministry of Health (*Brit. M. J.* **2**:585, 1958). They found that psychological medicine was an integral part of all general practice. Every good family physician must be a good psychologist. To misdiagnose psychological illness is just as bad as misdiagnosing organic disease and may lead to even greater unhappiness. So much medical teaching is concerned with organs and tissues that the family doctor may lose sight of the patient as an individual with fears, anxieties, guilt feelings, and inadequate relationships with other people. It is considered by general practitioners that about 30% of their patients have some form of psychiatric disturbance. These fall into five main groups which frequently overlap. They are anxiety and depression from emotional stress, constitutional liability to anxiety or depression, constitional personality and behavior difficulties, psychoses, and organic brain disease. The last two are comparatively rare, but involutional depression and arteriosclerotic senile dementia are by no means uncommon.

Every organic illness has its natural psychological component, which may be hardly noticed or severe. Such conditions as cancer, venereal disease, arthritis, and heart disease may be accompanied by superadded emotional upset, while others—premenstrual tension, spastic colon, ulcerative colitis, asthma, and eczema—are on the borderline between the physical and psychological. Certain symptoms are particularly prone to cause reactive anxiety or depression. Many of these patients with psychological disturbances have to be supported and managed by their family physician. The general practitioner starts with an advantage over the consultant in the management of these patients because of his knowledge of their background and their families. Responsibility for mental health will rest more and more on the general practitioner in the future. A great deal remains to be done before he is skilled enough and adequately equipped to do as good work in this field as he is able.

Psychological medicine should be taught more thoroughly to all medical students, and more opportunities for postgraduate training in it should be open to all general practitioners. It might be advantageous for a group of physicians to have one partner who, though still in general practice, has been specially trained in this branch of medicine. In helping their patients with psychological illnesses family doctors should take more opportunity to develop team-work in the ancillary health services

to which they have access. The Ministry of Health should investigate the possibility of giving more opportunities and recognition to general practitioners with a special interest in psychological medicine.

Ischemic Heart Disease.—Thomas and co-workers estimated the prevalence of ischemic heart disease in South Wales (*Lancet* 2:540, 1958). The cardiovascular status of 100 miners from an industrial area was compared with that of 100 men from an agricultural area nearby. The age range was 55 to 64. A pilot survey in which clinical, radiologic, and electrocardiographic evidence was used for diagnosis suggested strongly that the electrocardiogram was the most useful in assessing cardiac status. The clinical examination was sometimes of value, but the posteroanterior chest x-ray was of little diagnostic aid. The same clinician made a diagnosis on the clinical and electrocardiographic evidence, and all electrocardiograms were interpreted by three cardiologists, whose findings varied widely. Two indexes of ischemic heart disease were used —the clinical index, based on clinical assessment, electrocardiography and radiography by one cardiologist, and the electrocardiographic index, based on agreement between three cardiologists that an electrocardiogram showed changes compatible with the diagnosis of ischemic heart disease. The prevalence in these men, based on clinical assessment, was 25% in the agricultural area and 38.3% in the mining area. The figures based on electrocardiographic assessment were 17% and 21.3% respectively. Though the mining group seemed to have a somewhat higher prevalence of ischemic heart disease, the difference was not statistically significant. Those affected were both taller and heavier than the others. The siblings of the men with ischemic heart disease had a higher mortality than the siblings of the controls. No significant difference was noted in the mean serum cholesterol levels in those with and those without ischemic heart disease.

New Hypoglycemic Agent.—The results obtained in 43 diabetics treated with a new hypoglycemic agent, chlorpropamide, were reported by Murray and co-workers (*Lancet* 2:553, 1958). Chlorpropamide, or N(propyl-N-chlorobenzene) sulfonyl urea, which is chemically related to carbutamide and tolbutamide, was given to a group of diabetics who had had diabetes for less than 10 years, who were either not taking insulin or had not been taking it for more than two years and who were over 40 years old. Diet alone failed to control the diabetes in most of these patients. Thirteen were hospitalized, and 30 were outpatients. The drug was given as a single daily dose of 1 Gm. orally. If after a few days treatment a good response was obtained, the dose was reduced to the lowest effective level. A satisfactory hypoglycemic response was obtained in 28 of the 43 patients treated, or in 65%. Ketonuria had been previously noted in 27% of the failures, compared with 4% of the successes. If a favorable response occurred, judged by a sugar-free urine, it did so by the second or third day, and always within a week. In the responders the mean blood sugar level fell from 273.5 mg. per 100 ml. before treatment to 161.8 mg. at the end of two weeks, while in the nonresponders the mean figures were 364.5 mg. and 304.5 mg. The mean daily glucose output was reduced from 35.5 to 3.4 Gm. in the responders, and in the nonresponders it remained constant at 58 to 60 Gm. daily.

Over half the responders had been previously treated with carbutamide or tolbutamide. The impression gained was that chlorpropamide was less potent than carbutamide but more potent than tolbutamide. Increasing the dosage to 3 Gm. daily brought under control three patients who did not respond well to 1 Gm. daily initially. As it was not thought desirable to give more than 1 Gm. daily, this dosage was considered excessive and the cases were regarded as failures. There were no serious toxic effects, such as leukopenia or thrombocytopenia. Nine patients complained of nausea, a diffuse erythematous rash, and drowsiness. Increasing the daily dose from 1 to 2 Gm. often caused these side-effects.

Cost of Iron Preparations.—The cost of iron preparations for oral use in general family and hospital practice was investigated by Davidson and Richmond (*Lancet* 2:570, 1958). They stated that ferrous sulfate tablets, with or without added trace elements, and whether bought as a proprietary or nonproprietary preparation, were the cheapest form of iron for oral medication. Since ferrous sulfate raises the hemoglobin level as effectively as other iron salts, such as the gluconate and succinate, and, when given in comparable doses of elemental iron, is no more likely to cause gastric upsets, it should be the first choice for oral iron therapy. An analysis of hospital prescriptions showed that ferrous sulfate forms 46% of all the iron preparations prescribed, while the newer organic iron preparations form 54%. In general practice, however, ferrous sulfate tablets form only 23% of all the iron preparations prescribed, whereas the more expensive organic preparations form 77%. The cost of iron tablets to the National Health Service is about $150,000 per month, but if ferrous sulfate were always prescribed whenever iron for oral use is required, the annual saving would be nearly $1,000,000.

MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Effect of Acute Digitalization in Patients with Rheumatic Heart Disease. L. Werkö, H. Eliasch, B. Thomasson and E. Varnauskas. Cardiologia **33:** 161-194 (No. 3) 1958 (In English) [Basel, Switzerland].

The immediate effect of the administration of cardiac glycosides was studied in 56 patients with rheumatic heart disease. Four of these patients had aortic valvular disease only, 31 had pure mitral stenosis, 1 had mitral incompetence, 8 had multivalvular involvement, and the remaining 12 had mitral stenosis associated with other disease. Ten patients were in congestive failure. In 20 patients the clinical diagnosis was confirmed by autopsy. Lanatoside C was given to 37 patients in a dose varying between 0.4 and 1.6 mg., strophanthin K was given to 11 patients in a dose of 0.5 mg., Scillaren was given to 6 patients in a dose varying between 0.5 and 1 mg., and acetyldigitoxin was given to 3 patients in a dose of 0.6 mg. The cardiac output and the pressures in the pulmonary and systemic circulations were determined before the drug was administered and 30 and 60 minutes after the drug was given. In 6 patients the response to 10 minutes of exercise was studied 30 to 40 minutes after the drug was given. In 2 patients similar exercise studies were performed both before and 30 minutes after lanatoside C had been administered. In 7 patients the effect of the cardiac glycoside was studied after the extracellular fluid volume or plasma had been increased by rapid intravenous infusions of crystalloid or colloid solutions. In 2 patients pulmonary edema occurred early in the procedure. In these patients the effect of therapy with lanatoside C and strophanthin K, respectively, was studied before any other treatment was instituted.

It was found that in acute digitalization the right atrial pressure decreased in all patients. This decrease was of physiological significance only in the patients with right heart failure (from 10.8 ± 1.54 to 4.8 ± 0.95 mm. Hg). The pulmonary arterial blood pressure decreased in some patients, and its drop was most pronounced in the patients with atrial fibrillation who were not in congestive heart failure (39.8 ± 4.09 to 31.2 ± 3.34 mm. Hg). The cardiac output increased only in the patients in congestive heart failure. The stroke volume increased only in the patients with atrial fibrillation: in those not in congestive failure, from 39.8 ± 4.45 to 51.1 ± 5.09 mm. Hg; in those in congestive failure, from 36.7 ± 4.61 to 48.2 ± 5.73 mm. Hg. The heart rate usually decreased. This was most marked in patients with atrial fibrillation. Strophanthin K and Scillaren had the most rapid action, but the rapidity of action of lanatoside C and acetyldigitoxin almost equalled that of the first 2 drugs. Otherwise no difference was found among the drugs. The exercise tolerance was greatly improved in the patients with atrial fibrillation but not in those with sinus rhythm. Digitalization did not influence the hemodynamics to any great extent in the patients without congestive failure in whom the plasma volume was increased with infusions of crystalloid or colloid solutions. In 2 patients severe pulmonary edema occurred in the course of treatment. The edema did not disappear as a result of treatment with lanatoside C in one patient and with strophanthin in the other; administration of oxygen relieved the anoxia, and after additional administration of morphine and theophylline the edema disappeared.

Patients with mitral stenosis and sinus rhythm should be digitalized only if they have signs of congestive heart failure or if left ventricular failure is suspected (in the presence of arterial hypertension, mitral incompetence, or aortic valvular disease). Patients with mitral stenosis and atrial fibrillation should always be digitalized regardless of the occurrence of signs of failure of the right heart. Further studies regarding the behavior of patients with mitral stenosis during exercise in different stages of digitalization seem to be indicated.

Some Aetiological Aspects of Coronary Heart Disease: An Indian Point of View Based on a Study of 867 Cases Seen During 1948-55. R. P. Malhotra and N. S. Pathania. Brit. M. J. **2:**528-531 (Aug. 30) 1958 [London].

The authors report on 754 men and 113 women with coronary heart disease who were admitted to hospital or seen in private practice in Amritsar in the Punjab, India, between 1948 and 1955. Obser-

The place of publication of the periodicals appears in brackets preceding each abstract.

Periodicals on file in the Library of the American Medical Association may be borrowed by members of the Association or its student organization and by individuals in continental United States or Canada who subscribe to its scientific periodicals. Requests for periodicals should be addressed "Library, American Medical Association." Periodical files cover 1949 to date only, and no photoduplication services are available. No charge is made to members, but the fee for others is 15 cents in stamps for each item. Only three periodicals may be borrowed at one time, and they must not be kept longer than five days. Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

vations on these patients concerning age (including the younger age groups), profession, family history, body build in general, and association with diabetes mellitus and hypertension did not in any way differ from those of Western workers. The ratio of men to women was more or less the same as that described by Western workers; thus, the degree of relative immunity from coronary disease enjoyed by the female sex in India is no greater than in the West despite the fact that women lead a comparatively much more sheltered and indoor type of life, that they are mostly vegetarians, and that addiction to tobacco or alcohol is practically unknown among them.

The role of the fat content of diet in the causation of coronary disease is a controversial point. The fat content of the diet taken by most of the 867 patients was poor as compared with European standards. Consequently it seems difficult to believe that dietary fat can play any significant part in the causation of coronary disease. The observations on these patients showed that vegetarians are no less prone to the occurrence of coronary disease, and the same is true of nonsmokers, since no less than 50% of the patients belonged to the Sikh sect whose religion forbids smoking. Obesity has long been recognized as an important predisposing factor. Of the 754 men, 204 were obese, 500 were of average type of build, and 50 were thin; of the 113 women, 48 were obese, 57 were of average type of build, and 8 were thin. These data suggest the greater importance of obesity in the causation of coronary disease in women than in men.

Coronary disease is a major cause of deaths in countries that are materially more advanced. Of the 867 patients, only 123 (14%) were from rural areas, but this finding does not justify the assumption that the disease is less prevalent among persons living in places remote from modern civilization. Patients from villages came to the town hospitals only when they were severely disabled by congestive heart failure or when their physical activity was seriously curtailed by severe anginal pain on effort. Brief or mild episodes of coronary disease remained unnoticed, and the same was true for sudden deaths. Furthermore, small villages near big towns cannot be considered rural in the real sense of the word. A great deal of work and money would be required for an investigation in those remote areas of India in which the mode of life continues to be what it was in the 18th century. With the present standard of vital statistics in India, it is difficult to give the true incidence of coronary disease in this part of the world. But with 867 cases of coronary disease (28.4%) occurring among a total of 3,054 patients with diseases of the heart seen during the observation period, it is difficult to share the view held by Western workers that coronary disease is uncommon in materially less-favored countries.

Traumatism in the Pathogenesis of Primary Rheumatism. L. Schiavetti and A. Gospodinoff. Policlinico (sez. prat.) **65**:1015-1025 (June 30) 1958 (In Italian) [Rome].

The authors reviewed the history of 400 patients with rheumatic disease, who were treated at the Center of Rheumatology in Rome during the period 1952-1957, and found that 14 of them (3.5%) had a post-traumatic rheumatic arthritis. Traumatism is probably an aspecific, pathogenetic factor which contributes to the clinical manifestation of primary rheumatism (rheumatic fever, rheumatoid disease, and ankylosing spondylitis) in persons who are predisposed to the disease. This correlation was more clearly observed in instances of acute rather than in chronic rheumatic disease. A period varying between 13 and 25 days elapsed between the traumatic episode and the manifestation of the rheumatic disease.

The case of a woman, aged 36 years, is reported, which illustrates the pathogenetic correlation between traumatism and primary rheumatic disease. The patient had had post-traumatic hydrarthrosis in the right knee 4 years previously. The synovial fluid showed no evidence of inflammatory reaction, and the disorder subsided shortly. However, swelling associated with an intra-articular inflammatory exudate reappeared 3 months later, and after that at irregular intervals. The disease developed into intermittent hydrarthrosis. An injury to the left hand, which occurred 2 years later, was followed by rheumatic arthritis; this process involved the patient's ankles and knees the following year.

The correlation between traumatism and primary rheumatic disease is also relevant in problems of health insurance and industrial health. The physician sometimes has to evaluate the extent to which a mechanical injury has contributed to the development of a rheumatic disease, or he may be called upon to dissuade persons who are predisposed to rheumatic disease from engaging in activities exposing them to acute or chronic mechanical injuries.

Dicumarol and Serum Uric Acid. O. E. Hansen and C. Holten. Ugesk. læger **120**:974-975 (July 24) 1958 (In Danish) [Copenhagen].

A uricosuric effect of Dicumarol has been observed. In most of the 40 patients given anticoagulant treatment with heparin prolongatum and Dicumarol, there was a reduction of over 20% in the serum uric acid value. The uric acid determinations were made as double measurements according to the Praetorius method. The question is raised as to what extent the improved prognosis in ischemic cardiac disorders after treatment with anticoagulants depends only on the prolonged coagulation time, or whether the effect of these agents on the uric acid metabolism may be significant.

The Salicylate Problem with Special Reference to Methyl Salicylate. H. M. Cann and H. L. Verhulst. J. Pediat. 53:271-276 (Sept.) 1958 [St. Louis].

The widespread use of acetylsalicylic acid, the extreme toxicity of methyl salicylate, and the public's unawareness of the toxicity of these substances are the main reasons for the extent of this problem. When a child has accidentally ingested a salicylate product, treatment should be started as soon as possible. In all cases the stomach must be emptied promptly, and mild intoxication can be remedied by this procedure alone. Since methyl salicylate delays stomach emptying, gastric lavage may, therefore, be carried out as long as 4 to 6 hours after ingestion. If gastric lavage is performed, sodium bicarbonate should not be used, since it enhances salicylate absorption from the gastrointestinal tract. In 2 of the 3 cases cited, in which children died from accidental ingestion of methyl salicylate (wintergreen oil), despite labeling on the bottle, the warning was not heeded that the drug should be "kept out of the reach of children." In none of the 3 cases were immediate attempts made to empty the stomach, and proper therapy was delayed. In one case the similarity of a methyl salicylate container and a cough medicine container was apparently the cause of the fatal accident. The practice of some physicians in advising hospitalization—if only for overnight observation—in most cases of salicylate ingestion, whether or not symptoms have occurred, emphasizes the necessity of prompt, vigorous therapy and close observation in all instances of salicylate overdosage. The latter is especially important in methyl salicylate poisoning where the usual asymptomatic period after ingestion makes prolonged observation mandatory.

In acute salicylate poisoning, water is lost from the body by diaphoresis, hyperpnea, vomiting, and diarrhea, which loss results in impaired renal function and decreased salicylate excretion. The hypoprothrombinemic effect of salicylates, which can be corrected by the administration of vitamin K preparations, is well known. The treatment of established salicylate intoxication consists of giving fluids intravenously (orally in mild cases) to correct the existing water deficit; dextrose is administered to combat ketosis, intravenously administered calcium gluconate is given in the event of tetany, and oxygen should be administered if convulsions occur. Base solutions are contraindicated in the early stages, as they may lead to tetany, convulsions, and death, and they should not be given until acidosis supervenes some 4 to 6 hours later. Although there are some individuals who feel that sodium bicarbonate is not harmful when given early in the course of the development of symptoms, and despite the fact that renal excretion of salicylates is enhanced in the presence of an alkaline urine, base therapy must be administered cautiously, as rapid correction of the acidosis may result in alkalosis. Barbiturates, paraldehyde, and morphine are definitely contraindicated because of their synergistic effect with the salicylates in producing central nervous system depression. Good clinical results have been obtained with hemodialysis, and exchange transfusion has been used in cases of methyl salicylate poisoning with favorable results.

The 1957 Influenza Epidemic: A Study of 500 Cases Admitted into the J. A. Group of Hospitals, Gwalior, M. P. P. N. Laha and D. R. Bapat. J. Indian M. A. 31:53-58 (July 16) 1958 (In English) [Calcutta].

The authors report on 477 adults and 23 children with influenza who were admitted to a group of hospitals in Gwalior, Madhya Province, India, between June 1 and July 31, 1957, when the influenza epidemic engulfed the Gwalior area which includes 3 towns, namely, Lashkar, Gwalior, and Morar. The cases of influenza were distributed among the 3 religious groups (Hindu, Moslem, and Christian) in proportion to the number of persons in each group. Most of those affected (74.2%) were between the ages of 16 and 30 years. Males predominated in a ratio of 7 to 1 among adults and of 5 to 1 among children. The epidemic affected persons of every variety of occupation. Roughly estimated, the attack rate at Gwalior was 20% of the population. Fever, headache, cough, and body ache constituted the major tetrad of symptoms. Weakness and lassitude were present in only 4.2% and giddiness in only 2.1% of the patients. There was a small proportion of patients with only local symptoms, such as coryza and sore throat. Vomiting and rigor were sometimes very prominent in children, and atypical symptoms, such as dyspnea, giddiness, and increased frequency of micturition, were also observed. Laboratory studies were done on 100 patients; 91 of these had a normal white blood cell count, 5 had leukocytosis, and 4 had leukopenia. The erythrocyte sedimentation rate was increased in 84 patients and was normal in 16. The course of the disease lasted from 3 to 5 days in most of the patients, but in some patients it was prolonged to 7 days. There were no significant complications. The relapse rate was about 5%. There were no deaths.

All the patients were treated in separate wards to prevent spread of the infection to other patients in the hospital. The patients were kept under complete rest for at least 4 days even after the temperature was restored to normal, since premature activity was an important cause of relapse. Of the 500 patients, 237 were given salicylates, and 193 received salicylates and intramuscular injections of crystalline penicillin; 30 patients were treated with

salicylates, crystalline and procaine penicillin, and dihydrostreptomycin, 20 with sulfonamides, and 20 with crystalline penicillin alone. The number of days required to cure the patients ranged from 3 to 7 in each of the 5 groups. It was concluded that drugs did not modify the course of the disease.

Blood Ammonia Determinations in Liver Diseases. Li P'ei-Kuang, Lu Han-Ming, Ho Chih-Hsiung and others. Chinese M. J. 76:529-542 (June) 1958 (In English) [Peking, China].

The relationship of the liver and of the portal circulation to the metabolism of ammonia was recognized more than 60 years ago when the syndrome called "meat intoxication" was observed in Eck-fistula dogs with high blood ammonia levels. Later evidence was found that the elevation of blood ammonia levels might be one of the important causes underlying hepatic coma. The occurrence of episodic stupor in patients who have undergone portacaval anastomosis is likewise associated with elevated blood ammonia levels. The authors made 226 determinations of the ammonia content of the peripheral blood in 97 patients with a variety of liver diseases and several miscellaneous conditions, with or without involvement of the liver. The blood ammonia was determined by Conway's microdiffusion technique, as modified by Ting and Liu. Results were expressed in micrograms of ammonia-nitrogen per 100 ml. of blood. In normal controls the figures ranged between 20 and 50 mcg. per 100 ml., and 50 mcg. per 100 ml. was therefore accepted as the upper normal limit.

The authors have tabulated the ammonia-nitrogen values obtained in patients with cirrhosis of the liver, hepatitis mostly of viral origin, primary carcinoma of the liver, amebic abscess of the liver, schistosomiasis, nephritis, gastrointestinal diseases, cardiac disorders, and miscellaneous diseases. The results suggest that the ammonia-nitrogen values may, to a certain extent, reflect the functional state of the liver. An elevation of the ammonia level is usually observed in cases of liver diseases with diffuse parenchymatous damage and portal-systemic shunt or collateral circulations. In hepatic coma or precoma the ammonia-nitrogen values are usually very much elevated, greatly exceeding the values observed in the same patient during the absence of coma. It is, therefore, believed that the disturbance of ammonia metabolism must be one of the important causes of hepatic coma.

The ammonium chloride tolerance test was made in a group of patients with and in a group without hepatic insufficiency and collateral circulation. The results of this test differed greatly in these 2 groups, and it is suggested that this test may supplement the simple blood ammonia-nitrogen determinations.

Primary Renal Hypokalemia—Primary Aldosteronism. G. Alsted and P. Halberg. Ugesk. læger 120:979-982 (July 24) 1958 (In Danish) [Copenhagen].

The differential diagnosis between primary renal hypokalemia and primary aldosteronism is difficult but extremely important. In hypokalemia continued potassium treatment must be applied, while aldosteronism can be cured radically by operation. A case of potassium-losing nephritis in a woman, aged 43 years, is described. There had been no previous renal disorder. The chief symptoms were loss of weight, progressive muscular adynamia, slight proteinuria, polydipsia, polyuria, and hyposthenuria. There were hypokalemia and typical changes in the electrocardiogram. Potassium therapy was instituted, but the patient died within 2 weeks after admission. At autopsy nephrotic changes were found in the kidneys, but there was no evidence of acute or chronic renal infection. The adrenal glands were morphologically normal; the pituitary gland was somewhat enlarged; and microscopic examination revealed an increased number of basophil cells in small adenoma-like groups. Technical facilities for determining the aldosterone excretion were not available. Because of the findings in the hypophysis and the absence of primary infectious renal changes, and in spite of the absence of a tumor in the adrenal cortex, the case is regarded as one of primary aldosteronism.

UROLOGY

Retrograde Ejaculation as Cause of Sterility in the Male. A. M. C. M. Schellen. Nederl. tijdschr. geneesk. 102:1252-1253 (June 28) 1958 (In Dutch) [Amsterdam].

The author presents the history of a 35-year-old man who had been married for 8 years but who had no children. The history revealed that during coitus the patient had the sensation that, while semen was expelled, there was no ejaculum. Since the patient's genitalia seemed to be free from pathological changes, he was told to urinate shortly before and shortly after cohabitation and to collect the postcoital specimen for examination. Two postcoital specimens of urine revealed the presence of normal spermatozoa. The author feels that the patient has an idiopathic form of retrograde ejaculation. If a patient with this condition requests treatment for sterility, urologic therapy may be contemplated but is often found impracticable. Artificial insemination may be effected with seminal fluid obtained from the patient's bladder. The author found reports of 8 similar cases in the literature and believes that more cases will be recognized if retrograde ejaculation is thought of in patients with aspermia.

Vesicoureteral Reflux in Children. B. W. Jones and J. W. Headstream. J. Urol. 80:114-115 (Aug.) 1958 [Baltimore].

The authors report on 70 boys and 30 girls, their ages ranging from 14 days to 14 years, who were subjected to voiding cystography in order to determine whether reflux occurred in children without history or findings suggestive of urinary tract disease. These patients had a nonurologic admission with a negative urinalysis. Of the 100 children examined by voiding cystography, only 1 exhibited vesicoureteral reflux. Subsequent examination of the patient with vesicoureteral reflux revealed bladder neck contracture, and a transurethral resection was performed with an uneventful postoperative course. Follow-up studies 6 months later demonstrated bilateral reflux on voiding cystography, no residual urine, and negative urinalysis. It is the authors' belief that children with normal urinary tracts will not exhibit vesicoureteral reflux. Thus, this study supports the findings of those who claim that vesicoureteral reflux occurs only in the presence of demonstrable uropathy.

OTOLARYNGOLOGY

Executive's Dysphonia: A Study of 49 Patients. W. H. Gardner. Cleveland Clin. Quart. 25:177-186 (July) 1958 [Cleveland].

The subjects of this study were 49 business men who had been referred for examination of the voice. The majority were from sales and personnel departments. They were selected on the basis of 2 criteria: (1) the patient held an executive position that involved command of and communication with a large number of persons, and (2) his vocal disorder could be classed as functional dysphonia. The patients ranged in age from 32 to 70 years. Forty-four of the 54 findings among the otolaryngologists were in patients with functional dysphonia, 6 in those with contact ulcers, and 4 in those with nodules. Chronic rhinitis was the single most frequent finding. The duration of the vocal disorders ranged from 1 month to 20 years. The 49 patients reported 243 symptoms: 153 by those having functional dysphonia, 63 by those having contact ulcers, and 27 by those having nodules. Hoarseness was reported by all the patients. A total of 194 vocal deviations, including hoarseness, monotony, and breathy voice, were observed by the voice therapist, an average of 4 deviations per patient. More than half of the 49 patients had limited ranges of speaking pitch.

In addition to voice therapy that was recommended for all 49 patients, antihistaminics or hypoallergics (16), diet and vitamins (16), no smoking (6), prednisone (3), and tranquilizers (2) were advised for 43 of the executives having dysphonia. Voice therapy was successful in all of the 37 patients who participated in the program; 31 achieved clear voices, and 6 had improved voices. In 9 of the 10 patients having contact ulcers who received voice therapy, the ulcers disappeared or improved; and in 5 of the patients having nodules, the nodules cleared or improved. The remaining 3 patients having contact ulcers who refused therapy remained unimproved; 1 of these developed an additional granulation requiring surgery. Of the 9 patients having functional dysphonia who did not receive voice therapy, 5 refused the therapy and appeared to be satisfied with the results of tranquilizers; 3 refused the therapy because they were "too busy"; and 1 was referred to another therapist. The author is of the opinion that the best results are obtained with a combination of voice therapy and medical measures.

Intermittent Parotid Swelling Due to Ill-Fitting Dentures—An Entity; Its Diagnosis and Treatment. A. C. Furstenberg and I. M. Blatt. Laryngoscope 68:1165-1181 (July) 1958 [St. Louis].

The authors report on 3 women, between the ages of 46 and 72 years, with diffuse parotid swelling associated with pain and a feeling of pressure in the cheek while eating. All 3 patients had been wearing complete or partial dentures for many years. When salivary flow was stimulated by lemon, the parotid gland swelled. On massage of the parotid region, only a sluggish flow of clear saliva from a hypertrophic parotid papilla was noted. The cordlike dilated Stensen's duct was palpable along its buccomasseteric course. On probing the duct, dilated segments alternated with strictures. The wall of the duct imparted a gritty sensation on probing; this was caused by the hypertrophic and metaplastic duct epithelium.

This condition of parotid swelling appears definitely to be associated with the presence of dentures. The patient is required to alter the mechanism of mastication in a manner which does not sustain the normal chewing habit. As food is being chewed on one side of the mouth, the parotid papilla on the opposite side tends to be sucked mesially and bitten. Mastication is further rearranged and altered when alveolar absorption occurs, allowing the dentures to shift about while chewing. When the parotid papilla is subjected to repeated trauma and inflammation, fibrous tissue proliferation and scar tissue cicatrization occur. This interferes with normal salivary flow, and the ensuing pressure behind the stricture results in dilatation of the duct of the gland. Secondary bacterial infection supervenes with a diffuse inflammatory reaction along the buccomasseteric course of Stensen's duct and with production of multiple inflammatory strictures. If a stricture in the secondary or tertiary ducts seals off a section

of secreting acinar tissue, an inflammatory cyst may be formed. Secretory sialography is useful in making the diagnosis and in differentiating the condition from nonobstructive sialectasis.

Surgical treatment in this series consisted of subtotal parotidectomy on one patient, in whom an inflammatory cyst was revealed by the parotid sialogram. Dochoplasty was carried out on the other 2 patients. Healing was prompt. Rapid regression of parotid swelling occurred in all 3 patients, and they remained asymptomatic. Microscopic examination of the surgical specimen revealed stenosis, scar tissue formation, and metaplasia of the duct epithelium. All these findings were compatible with traumatization of the parotid papilla. The syndrome of obstructive sialodochitis, with intermittent parotid swelling caused by ill-fitting dentures, may be regarded as a definite entity.

THERAPEUTICS

Advantages and Limitations of Additional Treatment of Tuberculous Meningitis with Corticosteroids. B. Dieckmann. Beitr. Klin. Tuberk. 118: 252-261 (No. 4) 1958 (In German) [Berlin].

The author reports on 8 women and 6 men with tuberculous meningitis, who were treated continuously with streptomycin and isoniazid until their cerebrospinal fluid was restored to normal; 1 Gm. of dihydrostreptomycin was given first daily and later twice weekly by intramuscular route, and 10 to 20 mg. of isoniazid was given orally. Seven of the 14 patients received, in addition, cortisone, hydrocortisone, or prednisolone orally, and 2 patients with spinal block received these drugs also by lumbar and cisternal route. The survival rate in both groups of patients was the same; a 50-year-old man in the cortisone group died after temporary improvement at the end of the 11th week of treatment, and a 54-year-old woman in the other group died in the 4th week. The surviving patients in the cortisone group were followed for 1 to 1½ years and those in the other group for 2 to 4 years after their discharge from the hospital. All 12 surviving patients remained free of recurrences, but one of those who had not received cortisone therapy still had spastic paresis of both legs and another had paralysis of the right peroneus muscle. Two women in the cortisone group also had residual neurological symptoms. The body temperature of the patients in the cortisone group was restored to normal in one-third the time required by those in the other group. Drop of temperature by crisis did not occur in any of the patients; defervescence occurred within 2 to 6 weeks.

The cerebrospinal fluid of the patients in the cortisone group was restored to normal (with cell values not exceeding 30 per cubic millimeter, glucose content at least 50% of the actual blood sugar level, and protein level below 25 mg. per 100 cc.) in two-thirds the time required by those in the other group, i. e., 15 weeks, on the average, in the cortisone group as compared with 22 weeks in the other group. Exacerbations no longer occurred after that time. The more rapid normalization of the spinal fluid was reflected not only by the reduced number of cells but also by the glucose level. The protein level dropped rapidly except in one patient with spinal block; in the latter, however, block systems were no longer demonstrable at the end of 21 weeks of therapy after he had received 15 to 30 mg. of prednisolone orally daily and 12.5 mg. of hydrocortisone every second or third day by the cisternal route for 10 weeks. Improvement of the general condition was impressive in the cortisone group; within a few days of therapy there was a fundamental change, with clearing of consciousness, euphoria, increased appetite, and increase in body weight. There were no significant untoward reactions. Slight hypopotassemia was compensated by oral administration of potassium chloride. The shortened duration of treatment also had the advantage that less streptomycin and isoniazid had to be given.

Rapid improvement of the general condition, rapid defervescence, and marked shortening of the duration of treatment are the advantages of the combined antituberculous and cortisone therapy. The expectations concerning the removal of the obstruction in the spinal canal and that of neurological complications were not fully justified.

Treatment of Biermer's Disease with a Combined Preparation of Intrinsic Factor and Vitamin B_{12}: Clinical Trials. P. Croizat, L. Revol, R. Creyssel and others. Presse méd. 66:1204-1206 (July 2) 1958 (In French) [Paris].

A French proprietary preparation, containing 125 mg. of intrinsic factor, 100 mcg. of cyanocobalamin (vitamin B_{12}), 100 mg. of ferrous betaine, and 75 mg. of concentrated liver extract, was given a therapeutic trial in 35 patients with pernicious anemia who received this preparation orally. Eleven of the 35 patients were given large doses of 3 to 6 tablets of the preparation daily. In 9 of the 11 patients a reticulocyte crisis was produced in a normal manner, at the 3rd day as the earliest and at the 8th day as the latest; it was possible to follow in a regular manner the normalization of the Price-Jones curve in the course of the treatment. The drop in the iron level of the serum was also observed in a regular manner; complementary treatment with iron was even required occasionally. A normal vitaminemia was obtained in 6 of the 11 patients. These results compared favorably with those obtained in 64 patients with pernicious anemia, who were treated in the classic manner

by the parenteral route, 42 of them receiving injections of cyanocobalamin, 8 receiving folic acid, and 14 receiving liver extracts. The oral treatment was ineffective in only 2 patients; in one of them a reticulocyte crisis could not be obtained either by injections of cyanocobalamin, and in the other such a crisis was obtained by additional treatment with folic acid.

The observations on the 11 patients treated orally suggested the use of the combined preparation of intrinsic factor and cyanocobalamin as a routine oral treatment for pernicious anemia. Twenty-four patients with pernicious anemia, who for 3 years did not have any recurrence of anemic or neurological type while receiving maintenance treatment with cyanocobalamin by the parenteral route, were given substitute treatment with the combined preparation of intrinsic factor and cyanocobalamin by mouth. There was no change notable in the red blood cell count of these patients. The average number of red blood cells (4,670,000 per cubic millimeter) observed in the patients receiving oral treatment was nearly identical with the number (4,550,000) observed in 28 patients treated by the parenteral route and reported on by other workers. The cyanocobalamin blood level of the patients given oral treatment with the combined preparation remained definitely reduced (an average of 0.175 mg. per cubic centimeter). There was no difference between this level and that obtained with other preparations. The new preparation, as a rule, was well accepted by the patients.

Severe Neurological Manifestations in Four Children Receiving Compazine (Prochlorperazine). J. T. Jabbour, J. A. Sheffield and J. M. Montalvo. J. Pediat. **53**:153-159 (Aug.) 1958 [St. Louis].

Prochlorperazine (Compazine) is a relatively new antiemetic and tranquilizing agent, belonging to the large group of phenothiazine derivatives, of which chlorpromazine (Thorazine) and promazine (Sparine) are also members. The chemical name is 2-chloro-10-[3-(1-methyl-4-piperazinyl) propyl] phenothiazine. It was introduced into practice as an antiemetic and tranquilizing agent considered to have somewhat fewer toxic and side-effects than certain other ataractic agents. The authors present 4 children, ranging in age from 14 months to 5½ years, in whom Compazine produced a dramatic and characteristic clinical picture, with the following striking features: marked drowsiness and lethargy; oculogyric crisis; retraction of the neck, at times with torticollis; trismus; opisthotonos; at times, flexor rigidity; and hyperreflexia. These manifestations appeared suddenly in attacks that lasted from a few seconds to 2 hours and were followed by lucid intervals with normal neurological examination; there was a marked tendency to repeated attacks over a period of several hours. No permanent neurological damage was detected in any of the 4 children who were followed for a period of one month after their reactions. Two children received the drug on prescription for its antiemetic effect. The drug was given to another child for its tranquilizing effect in order to facilitate the intravenous administration of fluids. The 4th child accidentally ingested the drug. The amount given was clearly excessive in 2 cases and unknown in 1. However, the severest reaction of all occurred in the child who received the usually recommended dosage.

The Use of Trypsin in the Therapy of Tuberculous Lymphadenitis and Tuberculous Fistulae. C. Rapoport. Dis. Chest **34**:154-161 (Aug.) 1958 [Chicago].

The author reports clinical observations made between 1951 and 1957 on 6 girls and 2 boys, ranging in age from 8 to 13 years, and on a 33-year-old man, all of whom had been admitted to the Malben Tuberculosis Hospital in Israel. Seven of the children had tuberculous lymphadenitis, a 10-year-old girl had tuberculosis in portions of the sternum, and the man had tuberculous fistulas under the right clavicle with involvement of the first rib on the right side. Only those patients were selected for trypsin therapy in whom unequivocal evidence of the tuberculous causation of the lesions was present and who did not improve despite prolonged treatment with other antituberculosis drugs. Bacteriological studies (for Koch's bacillus), routine blood studies, urine examinations, liver function tests, electrocardiograms, and biopsies were performed at the start, during, and at the end of treatment, and for each patient roentgenograms were obtained of the neck, chest, vertebral column, and appropriate bones.

The patients received pure crystalline trypsin in sesame oil, 5 mg. daily in 2 divided doses for 6 weeks. The drug was administered intramuscularly in combination with one or more of the following: streptomycin, tetracycline, isoniazid (Rimifon), and aminosalicylic acid (PAS). In some patients the treatment was continued daily for 6 months, with an additional course of trypsin being given for 3 weeks at the termination of the 6-month period. No side-effects were noted during the treatment. Several patients obtained clinical healing within 3 to 6 weeks, as evidenced by a marked decrease in the size of the lymph nodes, disappearance of these nodes, closure of the fistulas, and scar formation. In those with bone tuberculosis the lesions healed more rapidly. From a histopathological point of view all the biopsies performed showed either marked improvement of the microscopic picture or evidence of complete healing. The rich deposition of collagen in healed lesions was noteworthy. Biopsy specimens obtained from lymph nodes at the end of treatment were negative on smear,

culture, and guinea-pig inoculation for Koch's bacillus. Trypsin administered together with antibiotics or antibacterial agents appears to be the treatment of choice for tuberculous lymphadenitis, and tuberculous fistulae secondary to the lymphadenitis, and for bone tuberculosis.

Haemorrhagic Thrombocythaemia: Report of Two Cases Treated with Radioactive Phosphorus. J. R. Fountain. Brit. M. J. 2:126-130 (July 19) 1958 [London].

Although bleeding accompanying thrombocytopenia is commonly seen in hospital practice, the association of hemorrhage and thrombocythemia is extremely rare, only 30 cases having been reported in the literature. Bleeding most commonly occurs from the nose and the alimentary tract; bruising is not uncommon; purpura is rarely observed; blood loss invariably results in a hypochromic anemia; and all cases show a raised platelet count and leukocytosis. Thrombotic episodes are not uncommon and are presumed to be a function of the increased number of platelets, although the exact mechanism is unknown. The bleeding time is sometimes prolonged, the remaining tests for hemostatic function being normal. Hemorrhagic thrombocythemia is usually associated with other myeloproliferative disorders or splenic atrophy. It may follow splenectomy, as was the case in one patient described in this article, and it is rarely primary in that it is unassociated with other pathological processes, as was found in the other patient reported by the authors. In both patients the platelet count returned to normal and the bleeding ceased after administration of radioactive phosphorus (P^{32}).

A New Orally Effective Long-Acting Ganglion-Blocking Agent for Hypertension (189c56). S. Locket. Brit. M. J. 2:74-78 (July 12) 1958 [London].

The compound 189c56 is a preparation that was developed as the result of earlier pharmocological investigations of ganglion-blocking agents for use in hypertensive states. Compared with pentacynium methylsulfate, to which it is chemically related, about twice the dose of the active cation of 189c56 is required by subcutaneous or intravenous injection to produce a commensurate fall in blood pressure. The initial studies indicated that 189c56 produces hydrodynamic changes and effects on renal function comparable to those of pentacynium, and it was possible to identify 189c56 in urine many days after the last therapeutic dose. Within the dose range of 200 to 1,250 mg. administered daily by mouth, it was possible to produce prolonged and marked hypotension in every patient receiving the salt 189c56 bis-methylsulfate trihydrate. The initial dose was on the order of 200 mg., and this was increased by 50 mg. every day until an appreciable hypotensive effect was obtained. Once a satisfactory drug level was reached —and this level was quite critical—the degree and duration of hypotension achieved showed very little variation. Where the maintenance dose was in the range of 300 to 1,250 mg., a reduction of 25 to 50 mg. reduced the clinical effect considerably, and, conversely, an increase of the same magnitude converted a moderately severe hypotensive effect into a marked and prolonged hypotension.

Dryness of the mouth was noticeable with larger doses, although gastric emptying was unimpaired. Disturbance of vision occurred, as with other ganglion-blocking agents, and was usually insignificant and readily alleviated with physostigmine or pilocarpine. The severity of hypertension did not influence the drug schedule, although it was noticed that younger patients required heavier maintenance doses, as did patients exhibiting renal insufficiency. Disturbances of bowel motility, constipation, urine retention, and ileus were conspicuously absent. One patient, who when first seen had considerable renal impairment, showed a marked improvement in his hypertensive state and renal function. Another patient died of uremia, although his blood pressure had been adequately controlled. Of the 2 other patients with impaired renal function, one has shown a progressive deterioration in renal function in spite of an initial marked improvement in general condition, while the condition of the other has improved, the blood urea level falling steadily to less than 30 mg. per 100 cc. With an effective reduction in blood pressure, these patients have shown a reversal of retinal changes, alterations in the electrocardiogram to a more normal tracing, reduction in heart size, and amelioration of many disturbing symptoms, such as paroxysmal nocturnal dyspnea and angina on effort. No significant effect was elicited upon duration of action of the orally administered drug, size of the dose, time of onset of symptoms, or hypotension by the considerable variation in constitution of the diet. No significant potentiating action of chlorothiazide was demonstrable.

Hematologic Complications Arising During Ristocetin Therapy: Relation Between Dose and Toxicity. E. J. Gangarosa, N. S. Landerman, P. J. Rosch and E. G. Herndon Jr. New England J. Med. 259:156-161 (July 24) 1958 [Boston].

Ristocetin is a new antimicrobial agent, a lyophilized preparation representing 2 antibiotics, ristocetin A and ristocetin B. These components have been isolated from the fermentation broth of the Actinomycete species, Nocardia lurida. Advantages ascribed to ristocetin include low toxicity, lack of development of resistant organisms, and

absence of cross resistance to other antibiotics. The authors review the clinical experience with ristocetin at the Walter Reed Army Hospital, Washington, D. C., and the U. S. Naval Hospital, Bethesda, Md. Of a total of 14 patients, 3 were treated terminally and died within 36 hours; another was given the medication for only 1 day and was subsequently treated with a different antibiotic. In 8 of the remaining 10 patients, complications developed during the course of ristocetin therapy. The other 2 patients were adult males who had staphylococcic pneumonia that responded dramatically to ristocetin, with complete resolution and without laboratory or clinical evidence of complications. In addition to routine hematological studies, the platelet count was followed carefully in 1 of these patients before, during, and after therapy, and no platelet depression was noted. The dose in these 2 cases did not exceed 25 mg. per kilogram of body weight per day.

Ristocetin in each of the 8 patients in this report was administered intravenously, dextrose being used as a diluent. Hematological complications developed in all 8 patients, and 3 of these had acute thrombocytopenia. Severe bleeding, which accompanied thrombocytopenia, contributed to the deaths of 2 patients. In the third patient with thrombocytopenia there was a prompt return of the platelet count to normal after the ristocetin dose was reduced from 50 to 33 mg. per kilogram of body weight. Blood examinations, including platelet counts, should be made regularly in patients receiving ristocetin. Furthermore, the drug should be used only in hospitalized patients to facilitate early recognition of complications and prompt treatment. Ristocetin therapy should be undertaken cautiously in patients with impaired renal function. The complications observed in this study are best explained by a peripheral direct toxic effect of ristocetin. Such complications may be reversible when recognized promptly and the drug withdrawn or the dose reduced. The authors feel that the demonstrated effectiveness of ristocetin in difficult enterococcic and staphylococcic infections, found to be resistant to other antibiotics, justifies its continued use.

Palliative Treatment of Cancer of the Genital Organs with Testosterone Enanthate. C. Giornelli. Minerva med. 49:2351-2354 (June 13) 1958 (In Italian) [Turin, Italy].

Twenty women with cancer of the genital organs were treated with testosterone enanthate after receiving a course of radium therapy and roentgenotherapy. Ten patients had cancer of the portio vaginalis uteri, League of Nations classification 3. The initial total dosage of testosterone enanthate, varying from 500 to 750 mg., was divided into 2 or 3 equal doses and administered every other day. The total maintenance dosage of 2,000 mg. was divided into 20 equal daily doses. This therapy produced improvement in the general state of the patients' health and in their appetite. Decrease in pain was not prompt, but it was lasting. The neoplastic masses had increased in size at the end of the treatment in all the patients.

Five patients had cancer of the portio vaginalis uteri, League of Nations classification 4. The initial total dosage of 1,000 mg. of testosterone enanthate was divided into 4 equal doses, which were administered every other day. The total maintenance dosage of 3,000 mg. was divided into 30 equal daily doses, with a drug-free period of 15 days after 20 days of therapy with the maintenance doses. This therapy produced slight improvement in the general state of health and in body weight and a decrease in pain. Gynecologic examination made 2½ months after discontinuance of drug therapy revealed larger neoplastic masses than at the onset of therapy in 2 patients; these 2 patients died afterward.

Three women had an inoperable cancer of the corpus uteri. The total dosage of testosterone enanthate, consisting of 2,500 mg., was administered in 2 courses lasting 15 and 10 days respectively. Testosterone enanthate brought about improvement in the general state of health and a decrease in pain. Consequently, the dosage of analgesic drugs which had been given to the patients was gradually decreased until it was nil. Two examinations, made 2 and 4 months after discontinuance of drug therapy, confirmed the persistence of the patients' improved state of health, appetite, body weight, and psychic state. Gynecologic examination revealed an unchanged state of the neoplastic masses.

Of the remaining 2 patients, one had a cancer of the vulva, with diffusion into the vagina and rectum and with bilateral inguinal metastases. She had received a course of roentgenotherapy. The initial total dosage of 1,000 mg. of testosterone enanthate was administered in 4 equal daily doses. The total maintenance dosage of 3,100 mg. was divided into 31 equal daily doses. The patient's state of health remained unchanged during the drug treatment, except for a slight improvement in appetite and in the psychic state. She died 5 months after discontinuance of drug therapy. The last patient, who was 47 years of age, underwent a Wertheim type of operation for carcinoma of the portio vaginalis uteri, classification 3, 8 months before the onset of chemotherapy. She was well for 6 months, after which intense pain in the lumbar region reappeared. The patient was given irradiation therapy, followed by treatment with testosterone enanthate in a total dosage of 2,300 mg. Improvement was evident 15 days after the beginning of this therapy, but deterioration began 3½ months later.

Clinical Evaluation of 6-Chloropurine in Leukemia of Adults. R. R. Ellison, D. A. Karnofsky and J. H. Burchenal. Blood 13:705-724 (Aug.) 1958 [New York].

Thirty patients, between the ages of 15 and 72 years, with acute leukemia were treated with 6-chloropurine. The bone marrow was predominantly or completely blastic in 14 of them. Five patients had acute granulocytic leukemia, and 11 had either acute granulocytic, myelomonocytic, or monocytic leukemia. Unless gastrointestinal side-effects necessitated diminishing the dose, 1 Gm. of 6-chloropurine was given daily as long as the total leukocyte count was stable or was falling slowly. If a rapid decrease occurred, the administration of the drug was discontinued temporarily and was started again as the count stabilized. Treatment was usually stopped temporarily when marrow cellularity was less than normal, as judged by the appearance of the smear and the aspirate, during the course of administration of the drug. Transfusions, intravenously administered fluids, and antibiotics were given when indicated by the clinical status of the patients. Three of the 30 patients had complete remissions, and 8 had partial remissions. The average time necessary for appearance of marrow remission was 8.1 weeks. In all 11 patients who had complete or partial remissions, a period of marrow hypocellularity preceded the occurrence of remission. The total period of response lasted from 4 to 46 weeks (average 18.3 weeks). In 6 patients who showed remissions, treatment was continued throughout the period of remission, and, therefore, relapse occurred during the treatment. Increasing the dose at the time of relapse in 2 patients produced no further response. In 4 other patients, 6-chloropurine was withdrawn because of leukopenia with a hypocellular marrow, and its administration was not started again until relapse occurred. Only one patient showed a second response. Administration of the drug was discontinued after 8 months of almost continuous administration in one patient because of severe anorexia and nausea. When this patient subsequently relapsed, 2 courses of 6-chloropurine therapy were given without beneficial effect.

Adequate courses of 6-chloropurine were given to 4 patients with chronic granulocytic leukemia. Three of these 4 patients responded to 6-chloropurine. Slight objective improvement was noted in 4 patients with lymphomas who were treated with 6-chloropurine, but improvement appeared only during the period of hematological toxicity when therapy had to be discontinued. A high incidence of jaundice was noted in the patients with acute leukemia and in the other patients treated with 6-chloropurine, but it is difficult to relate the occurrence of jaundice definitely to the therapy. While 6-chloropurine appears to be slightly superior to 6-mercaptopurine in acute leukemia in adults, the pattern of response would indicate that these agents have a similar mechanism and range of therapeutic activity.

Complementary Therapy of Cancer of the Cervix Uteri with Very High Doses of Testosterone Enanthate. M. Rossi, I. Siliotti, M. Giaquinto and others. Minerva med. 49:2355-2363 (June 13) 1958 (In Italian) [Turin, Italy].

Eight hospitalized patients with cancer of the cervix uteri, classifications 2 and 3, were each treated with 10 Gm. of testosterone enanthate, divided into 20 equal daily doses and administered intramuscularly. At the end of the treatment the following variations were observed: decrease in the erythrocyte sedimentation rate; increase in the azotemia level; decrease in the glycemia level; and slight decrease in the serum albumin level. The alpha-1 globulin level remained unchanged, but fractions of serum globulin alpha-2, beta, and gamma, increased slightly in value. The total serum protein value showed a slight increase, although it had been above the physiological limit even before the onset of hormonal therapy. There were no significant changes in the hepatic and cardiovascular functions. A clear improvement in well-being, appetite, body weight, and physical strength and a decrease in pain were observed. On macroscopic examination, the color and consistency of the tissues in the tumorous regions seemed improved, although no changes in the shape or in the total size of the tumors were noted. On microscopic examination, the histological and histochemical features of all the neoplastic masses remained unchanged; there was, however, evidence of slight reaction of the host tissues against the tumors, consisting in cornification and in necrotic processes of these tumors. Diminution in the serum acid phosphatase level also took place.

Untoward side-effects in the administration of testosterone enanthate consisted in the manifestation of certain features of virilism and in an increased sense of libido. The clitoris increased moderately in size in 6 patients, considerably in 1, and insignificantly in 1 after the dosage had reached 5 Gm. in each patient. Lowering of the pitch of the voice, which was noticed by each patient herself but was imperceptible to other persons, developed in 3 women. These variations did not produce unfavorable psychosensory changes in the patients. The patients were advised to continue with maintenance doses of the hormonal therapy after discharge. The authors believe that administration of testosterone enanthate is a useful complementary procedure to radiotherapy for management of inoperable cancer of the female genital organs.

PATHOLOGY

Importance of Staphylococcus Aureus in Pneumonia in the 1957 Epidemic of Influenza. A. L. Robertson, J. P. Caley and J. Moore. Lancet 2:233-236 (Aug. 2) 1958 [London].

The authors report on 140 patients, between the ages of 11 and 80 years, with pneumonia who were admitted to the City General Hospital in Sheffield, England, during the peak of the epidemic caused by the Asian variety of influenza, type A, virus in September and October, 1957. Results of bacteriological examination of sputum and autopsy specimens revealed that Staphylococcus pyogenes var. aureus was isolated from 38 (27%) of the 140 patients, Diplococcus pneumoniae from 12 (9%), and Hemophilus influenzae from 5 (4%). Eighteen of the 38 patients with staphylococci died, a mortality rate of 47%. Sixteen of the 102 patients without staphylococci died, a mortality rate of 16%. The over-all mortality rate among the 140 patients was 29%. There was no clear sex difference in either group. The strains of Staph. pyogenes var. aureus obtained from 12 of the 18 patients who died were sensitive to chlortetracycline (Aureomycin), chloramphenicol, penicillin, streptomycin, erythromycin, and sulfonamides; the strains of Staph. pyogenes var. aureus obtained from the remaining 6 patients were resistant to chlortetracycline, penicillin, streptomycin, and sulfonamides and sensitive to erythromycin and/or chloramphenicol. There was evidence that 13 of the 140 patients were infected in the hospital with strains of Staph. pyogenes var. aureus which were resistant to penicillin, chlortetracycline, streptomycin, and sulfonamides.

The treatment of the fulminating staphylococcic infections is very difficult, because it is necessary to treat both the bacterial infection and the attendant pulmonary edema and peripheral circulatory failure. Fourteen such patients died within the first week of admission to hospital, and all had been treated in hospital with massive doses of antibiotics, including erythromycin and chloramphenicol. Despite this treatment antibiotic-sensitive strains of Staph. pyogenes var. aureus were isolated from 12 of the patients at autopsy. In contrast, the less severely affected patients responded well to antibiotics, and those infected in the hospital with antibiotic-resistant strains responded well to the antibiotics indicated by the in vitro sensitivity tests.

Atherosclerosis and the Serum Mucoprotein Levels of the Australian Aborigine. C. J. Schwartz and J. R. Casley-Smith. Australian J. Exper. Biol. & M. Sc. 36:117-120 (April) 1958 [Adelaide].

The first of 3 groups of normal male subjects investigated was composed of 22 full-blooded male Pintubis living nomadically in the Western Desert of Central Australia and consuming essentially a simple bush diet. There were 21 full-blooded male Australian aborigines of mixed tribal origins in the second group, whose dietary and living habits more closely resembled those of the white people in the area. The third group consisted of 38 Australian males of European descent. These 3 groups, all of whom were healthy, normotensive, and without any clinical evidence of atherosclerotic disease or any other condition known to affect the serum mucoprotein levels, had a mean age of 32, 36, and 37 years respectively. The mean serum mucoprotein level of nomadic tribal Pintubis was found to be considerably lower than the mean level of the urban group of full-blooded detribalized aborigines and the mean level of a group of normal white Australians of comparable age. The latter differences are considered highly significant with p values less than 0.001. The differences between the detribalized aborigines and the white Australian controls is not significant. Atheroma is not found with either great severity or frequency in the Australian aborigines in contrast to the almost universal finding of extensive atherosclerosis in Australians of European descent. The fact that the urban group has a higher serum mucoprotein level than the nomadic Pintubi group precludes the possibility of an ethnic constitutional factor to account for the difference between aborigine and white Australian.

Natural History of Multiple Myeloma Before Radiological Evidence of Disease: Memorial Fund Lecture. E. F. Osserman. Radiology 71:157-174 (Aug.) 1958 [Syracuse, N. Y.].

In an attempt to support the theses that radiographically evident multiple myeloma usually has already progressed to an advanced stage and that the diagnosis of a proliferative disorder of plasma-cell origin is frequently possible by biochemical techniques before roentgen-ray changes are demonstrable, the author reports on 18 men and 6 women, between the ages of 46 and 82 years, with "dysproteinemia of the myeloma type." Serum protein electrophoresis revealed that the serum of these patients contained an abnormal protein at a time when there was neither clinical nor roentgenologic evidence of disease. The patients were followed for periods ranging from a few months to 3 years. Clinically and radiographically evident skeletal damage and disease patterns consistent with a diagnosis of myelomatosis developed in 2 of the 24 patients, and 1 of them died. Four additional patients died of causes other than those which could be directly attributed to primary plasma-cell proliferative disease. Autopsy was performed on 2 of these 4 patients, and microscopic examination revealed diffuse plasma-cell infiltration of the skeletal system, but no gross evidence of skeletal damage. Careful clinical, roentgenologic, and electrophoretic studies have been continued in the 18 surviving patients.

The concentration of abnormal protein has either remained constant or shown an increase. In none of these patients has a spontaneous decrease or a disappearance of the dysproteinemia been observed.

The patients included in this study had failed to satisfy the diagnostic criteria for one or another of the clinical variants of primary plasma-cell proliferation when they were initially examined. Patients with clinically evident para-amyloidosis, such as those with documented lymphatic dyscrasias and myeloma-type dysproteinemia, were specifically excluded, but it is quite probable that some of the patients still under observation will ultimately display one or another of these clinical patterns in which bone involvement is not a significant feature. The routine application of the technique of serum protein electrophoresis may, however, help in defining the earlier stages of plasma-cell proliferative disease, but it must be borne in mind that it is only after serum concentrations of 200 to 300 mg. per 100 cc. of an electrophoretically homogeneous protein constituent have been established that electrophoresis will ascertain its presence. In about 15% of patients with known myelomatosis there is no electrophoretically demonstrable dysproteinemia. These patients do, however, show an electrophoretically characteristic dysproteinuria. Possibly, routine urinary protein electrophoresis in patients with unexplained proteinuria might identify some of the cases of myelomatosis in an early stage.

Pathogenetic Importance of the Thoracic Portion of the Vertebral Column. H. Kamieth. Arch. orthop. u. Unfall-Chir. 49:585-606 (No. 6) 1958 (In German) [Munich, Germany].

The authors made a roentgenologic study of the thoracic spine in 100 patients with roentgenologically proved ulcers of the stomach and duodenum. The group included 83 men and 17 women. Sixty-one men and 11 women had duodenal ulcers; 20 men and 3 women had gastric ulcers; and the other 5 patients had both gastric and duodenal ulcers. Answers were sought to the following questions: 1. What morphologic and functional changes can be observed in the thoracic portion of the vertebral column? 2. What connections exist between the morphologic changes and the disturbances in the static functions? 3. Is it possible that the morphologic and functional changes will act as pathogenetic factors? The majority of patients (86 of 100) had lateral curvature scoliosis of the thoracic portion of the vertebral column, which, however, was essentially postural, since it could be compensated by forward flexion in two-thirds of the male patients and in about one-half of the female patients. A tendency to gradual fixation of the postural scoliosis was demonstrated by its appearance when a roentgenogram was made with the patient in the supine position. The convexity of the scoliosis was toward the right side in 60 of the patients and toward the left side in 21, and the remaining 5 patients had an S-shaped scoliosis. The percentile distribution of right-sided and left-sided scolioses coincided with the percentages of duodenal and gastric ulcers. All the scolioses involved the vertebral segments corresponding to the stomach and duodenum, that is, T-6 to T-9. The scolioses were mild, some being so slight that they could hardly be differentiated from variations within the normal range.

Spasticity of the musculature of the back was present in all but 17 of the 100 patients. Moreover, almost 90% of all the patients had pathological changes on the intervertebral disks. These disk changes and their relationship to osteochondrosis of the vertebrae, to Schmorl's nodules, and to spondylitic processes are discussed. On the basis of diagrams the author explains the pressure, shifting, and rotational forces that are most important in the production of the functional changes in the intervertebral disks. Spatial infringement in the intervertebral disk canals seems to be of vital importance, and this contraction of the canals seems to be a complex process, in which morphologic and functional, as well as nerve root, changes may play a part. It has not been definitely proved whether these various space-infringing factors or disturbing influences act directly on the nerve roots or indirectly by way of stasis and edematous changes in the intervertebral disk canals. There is also a possibility that the ligamentous apparatus, as well as the disks at the nerve roots, play a part. Morphologic-osteogenic changes seem to be less important than functional-dynamic changes. At any rate processes in the vertebral column seemed to play a part in 90 of the 100 patients with peptic ulcers.

A Histochemical Evaluation of Carcinoma in Situ of the Cervix Uteri. R. E. L. Nesbitt and A. R. Stein. Surg. Gynec. & Obst. 107:161-168 (Aug.) 1958 [Chicago].

The present study comprises a histological and cytochemical appraisal of cervical tissue obtained from 42 patients with carcinoma in situ, admitted to the gynecologic service of the Albany (N. Y.) Hospital during the 8-year period from 1947 to 1955. The diagnosis was established by cervical biopsy in 31 cases, the lesion being identified in the remaining 11 cases in uteri surgically removed because of leiomyoma, adenomyosis, diffuse pelvic endometriosis, and chronic salpingitis. In addition to the material obtained by biopsy, the uteri of 26 of these same patients were subsequently available. The periodic-acid Schiff procedure proved to be the simplest and most reliable of the staining tech-

niques for demonstrating the basement membrane beneath the cervical epithelium. The presence of intracytoplasmic glycogen in normal cervical epithelial cells and its absence in neoplastic cells is the biochemical basis of Schiller's iodine tinctorial test. The periodic-acid Schiff method was useful not only in identifying the basement membrane but also in determining objective invasion, as well as in evaluating the degree of maturation and differentiation of cervical epithelium. Carcinoma of the ectocervix is a distinct entity characterized by atypical basal-cell hyperplasia with a failure of cell maturation. This lesion when present in the endocervix results from reserve-cell hyperplasia with absolute failure in differentiation as well as in maturation. Basal-cell hyperactivity, atypical hyperplasia, and bizarre forms of squamous-cell metaplasia can readily be differentiated from carcinoma in situ by determining the stainability of the abnormal epithelium with the periodic-acid Schiff procedure and noting the degree and extent of cellular atypia. Histological variants in the form of basal-cell hyperplasia and atypical hyperplasia with delayed or irregular maturation in the intermediary epithelial zone were found infrequently. The latter lesion is predominantly a prickle-cell type and appears in both the ectocervical and the endocervical regions. The authors attempt to correlate the cellular changes and the biological characteristics of carcinoma in situ with a view toward standardizing the diagnostic criteria.

Immunity in Experimental Tuberculosis. B. K. Acharya, F. M. Sullivan and J. M. Robson. Am. Rev. Tuberc. 78:203-225 (Aug.) 1958 [New York].

The method of immunizing mice with an intracorneal or intradermal injection of mycobacterium tuberculosis, and challenging the animals by a subsequent intracorneal inoculation, was used by the authors to study quantitatively the development of immunity to tuberculosis. The immunity resulting from a previous vaccination was assessed by the development of macroscopic lesions and the extent of bacillary multiplication in the challenged eye. It was found that some degree of immunity could be shown with a challenge given 48 hours after vaccination and that the immunity gradually increased to a maximum about 1 month after vaccination. At this stage a small inoculum (about 500 organisms) underwent no multiplication whatever in the challenged eye. Immunity sufficient to prevent the occurrence of any macroscopic lesions in challenged eyes was observed up to 13 months after vaccination, the longest period studied. The introduction of a larger challenge dose in immunized animals was followed by bacterial multiplication and the production of a macroscopic lesion; i. e., the larger challenge did overcome the immunity, although the extent of the multiplication lagged behind that observed with a similar dose of bacilli in nonimmune animals. Detailed microscopic investigation showed that, when a large inoculum overcame immunity, this was not due to insufficient phagocytic invasion and that under thees conditions intracellular multiplication of organisms, with ensuing destruction of the cells, did occur. The production of immunity with bacilli killed by various methods then was investigated. The best results were obtained with phenol-killed organisms which, in large doses, produced an immunity almost comparable with that seen with live organisms.

RADIOLOGY

Intravenous Cholangiography: An Appraisal. I. S. Goldenberg and A. J. Kummer. Connecticut M. J. 22:585-591 (Aug.) 1958 [New Haven].

Fifty-seven cholangiograms were done on 54 patients during the period from 1954 to 1957. Cholografin was utilized in all these studies, except in one patient in whom an additional study was done with Intrabilex. All the studies were completed without incident save for a 55-year-old woman in whom a probable sensitivity reaction occurred. In 29 patients intravenous examination was necessary to evaluate upper abdominal symptoms after cholecystectomy. Symptoms suggestive of biliary tract disease were present in 10 patients in whom oral cholecystograms with Telepaque had been accomplished without visualization. In 18 patients both oral and intravenous methods were employed, because initial visualization with the oral technique had proved inadequate. It is of note that of 15 patients who failed to reveal visualization after single-dose and double-dose Telepaque administration 9 had good intravenous Cholografin visualization after oral and intravenous techniques, and in only one case was visualization better after oral Telepaque administration than after intravenous Cholografin. Three of the 7 patients presenting jaundice had the duct system visualized. Forty-two cholangiograms in which the biliary radicles were visualized were available for critical evaluation. Maximum concentration of injected material occurred in from 40 to 70 minutes in two-thirds of these patients, maximum density occurring in 3 patients in less than 40 minutes after injection and in 10 patients only after 70 minutes had passed. Of the total group of examinations done, 30 were interpreted as being normal insofar as visualization of the biliary system was concerned. Twelve studies demonstrated definite abnormalities, which included cholecystolithiasis in 6, choledocholithiasis in 2, and common duct obstruction in 2.

Only 10 patients in the present group had operative intervention after the intravenous cholangiogram. Pathology found at operation confirmed the intravenous study in 8 patients. In 5 patients in whom Cholografin studies revealed a cholecystolithiasis or choledocholithiasis, such stones were found at operation. An enlarged common duct was found at operation in 2 patients in whom it had been previously demonstrated, and in 1 patient in whom no stones were seen on intravenous study none were found at operation. Two patients had no apparent stones by roentgenography, but at operation they were found to have stones in the common bile duct and in the gallbladder. The authors consider intravenous cholangiography a good procedure but believe that it should be reserved for patients who are symptomatic and in whom all other methods of visualization of the biliary tract have failed, because, despite the infrequency of reactions to the injection medium, deaths have been reported.

ANESTHESIA

Hypothermia in Thoracic and Thoracoabdominal Surgery: Use of Light Cooling as an Adjunct to Anesthesia in Poor Risk Patients. L. A. Brewer and E. L. King. Am. J. Surg. 96:137-150 (Aug.) 1958 [New York].

The authors report on 18 patients, between the ages of 34 and 77 years, who were subjected to thoracic and thoracoabdominal surgery. Six of these patients had bronchogenic carcinoma; 6, carcinoma of the esophagus; 1, bilateral pulmonary tuberculosis; 1, chronic emphysema and calcification of the pleura; 1, benign stricture of the esophagus; 1, malignant teratoma of the mediastinum; 1, teratoma of the epicardium; and 1, multiple fractures, ruptured diaphragm, and sepsis. These patients were considered poor risks for conventional normothermic anesthesia, and extensive thoracic and thoracoabdominal surgery was performed on them with the aid of light hypothermia, i. e., the patient's body temperature was lowered to 33 to 30 C (91.4 to 86 F) by packing with ice. Premedication included small doses of barbiturates, meperidine (Demerol) hydrochloride, and atropine or scopolamine. The patients represented about 5% of this type of patients operated on by the authors during the same period. The indications for hypothermia were as follows: (1) cardiac conditions, including previous infarction, auricular fibrillation, myocardial insufficiency, and cardiac failure; (2) respiratory conditions, including low maximum breathing capacity and pulmonary reserve from various causes resulting in an actual or threatening hypoxic state; (3) generalized arteriosclerosis; (4) hepatic or renal insufficiency; (5) trauma; and (6) infection.

The most striking finding during surgical intervention was a bright red oxygenation of the blood and a slow, firm cardiac beat. A light anesthesia was maintained with high-oxygen concentration by means of small amounts of ether and/or nitrous oxide. Three patients, all undergoing esophagectomy, did not survive the postoperative period; death was caused by cerebrothrombosis in 1 patient on the 3rd postoperative day, by a cerebral embolus in 1 on the 5th postoperative day, and by delayed cardiovascular collapse in 1 on the day after surgical intervention. The advantages of light hypothermia appeared to be better oxygenation of the blood in the course of the surgical intervention, need of only small amounts of anesthetic for long operations, and less stress of operation. The disadvantages were low blood pressure during phases of surgery, cardiac collapse on mediastinal dissection, and delayed postoperative shock or cardiovascular collapse. With the light hypothermia used in this group of patients, ventricular fibrillation did not occur in any of the patients. Temperatures below the levels used are dangerous with present-day methods and probably unnecessary. Children and young and middle-aged adults tolerate light hypothermia quite well. Older patients (above 60 years of age) show more cardiac reflex sensitivity in the course of the operation and a greater incidence of delayed postoperative shock. The final place of light hypothermia cannot be stated at present. Because of the favorable results in these patients, which could not have been duplicated with the aid of normothermic anesthesia, further trial is definitely indicated.

PHYSIOLOGY

Hyperexcitability of the Pulmonary Sensory Endings in Asthmatic Subjects: Its Measurement, Characteristics, Causes, and Role as a Reflex Asthmogenic Factor. R. Tiffeneau. Presse méd. 66:1250-1252 (July 12) 1958 (In French) [Paris].

Acetylcholine administered by the respiratory route in aerosol form has a twofold action: 1. It excites the pulmonary motor effectors (the smooth muscles of the bronchi and the vessels, and the bronchial glands), bringing about bronchoconstriction which alters pulmonary ventilation and may lead to asthma. 2. It excites the pulmonary sensory nerve endings, giving rise to laryngotracheobronchial sensations and sometimes causing a tussigenic reaction. These two methods of action, which are pharmacodynamically distinct, are opposed by two elective antagonists: (1) atropine, which prevents excitation of the motor effectors, and (2) pentamethonium and hexamethonium, which prevent excitation of the sensory nerves but have no antagonistic effect on smooth muscle excitation.

The second or sensory-nerve-excitation method of action was used in studying and measuring the excitability of the pulmonary sensory nerve endings in 105 patients with asthma. The inhalation of an aerosol containing 100 mcg. of acetylcholine per liter often leads to cough in normal subjects, whereas inhalation of one containing only 30 mcg. of acetylcholine rarely does so. The excitability of a patient in whom cough is produced by a concentration of 100 mcg. may therefore be regarded as normal, while that of one who coughs on inhaling a solution with a concentration of only 30 mcg. may be regarded as abnormal. Application of this criterion to the findings obtained in these patients showed that the excitability of the pulmonary sensory nerve endings was greatly increased in 25 (23.8%) and moderately increased in 39 (37.1%). Acute diseases of the lungs, which are frequent in asthmatic subjects, probably help to increase the excitability of the pulmonary sensory nerve endings. Ordinary bronchitis and even a simple cold often cause a temporary increase in this excitability in both asthmatic and normal subjects. Moreover, the excitability of the sensory nerve endings tends to increase as the asthmatic condition worsens, as shown by the correlation between an increase in cough, expectoration, and sensitivity to exogenous irritants and a diminution in pulmonary function, on the one hand, and an increase in excitability, on the other.

The hyperexcitability of the pulmonary sensory nerve endings may become an asthmogenic factor by giving rise to a bronchoconstrictive reflex. Cold air and irritating particles carried by the wind serve to precipitate this bronchoconstrictive reflex. Study of the dyspneic manifestations of asthma seems to show that there is a similarity between irritating particles and allergenic particles: both are carried by the air, and both are an indirect cause of bronchoconstriction, the first through the intervention of a reflex, the second through that of a mediator (histamine). Allergenic aggression predominates in recent forms of asthma; irritating aggression, in asthma of longer duration. The two factors, however, may occur together, producing mixed dyspneic reactions as a result of the twofold irritant and allergenic effect on the lungs.

PUBLIC HEALTH

Preliminary Report on Mass Vaccination of Man with Live Attenuated Poliomyelitis Virus in the Belgian Congo and Ruanda-Urundi. G. Courtois, A. Flack, G. A. Jervis and others. Brit. M. J. 2:187-190 (July 26) 1958 [London].

The authors report on 244,596 inhabitants of the Belgian Congo and Ruanda-Urundi, of both sexes and all ages, who were vaccinated during the years 1957 and 1958 in the course of trials with live attenuated Chat strain, type 1, poliomyelitis virus by the oral route. Of these 244,596 persons, 2,511 received, in addition, Fox III strain, type 3, of attenuated poliomyelitis virus. The virus pools representing each strain were tested for lack of virulence in rhesus monkeys injected intracerebrally and intraspinally and in chimpanzees injected intraspinally. None of the intracerebrally injected monkeys and intraspinally injected chimpanzees showed signs of illness. Some of the monkeys injected intraspinally with the undiluted material showed signs of poliomyelitis infection. For additional testing, aliquots of each pool were injected into rabbits, mice, and guinea pigs in order to rule out the presence of other viral agents, such as the Coxsackie viruses. Although the material was filtered through bacteria-retaining filters, rigid tests for bacterial sterility were completed before the virus pools were used in man. The efficiency of each virus preparation was finally checked by feeding the virus to a small group of infants and adults in the United States. These persons had no antibodies against the type of virus administered, and there was no reaction of any kind. This procedure made it possible to determine the minimum immunizing dose of the virus, which was $10^{5.7}$ TCD_{50} for nonimmune children and adults and $10^{5.0}$ TCD_{50} for infants less than one month old. The virus preparation was administered in either capsule or liquid form. The approximate minimum dose fed to each individual was $10^{5.3}$ TCD_{50} of each strain. Throughout the period of administration the container of virus suspension was kept at 4 C. Immunization of the total population of the community was decided on only if 12% or more of the serums collected were found to have no antibodies against a given type of virus. Since type 1 virus was incriminated in most outbreaks of paralytic poliomyelitis, including those in the Belgian Congo, it was decided to give priority to vaccination with attenuated Chat strain, type 1, virus wherever it was statistically feasible.

In 2 localities, Aketi and Stanleyville, no signs of illness were observed after administration of the 2 types of viruses, and in almost 100% of the vaccinated persons antibodies against the 2 types developed which were determinable in the serums. No illness, which could be attributed to vaccination, was reported by medical authorities in a third locality, the Ruzizi Valley, after mass vaccination trial of Chat strain, type 1, poliomyelitis virus. On recommendation of the Expert Committee on Poliomyelitis of the World Health Organization, this live virus was administered orally during 4 outbreaks of paralytic poliomyelitis at Banalia, Gombari, Watsa, and Bambesa in the Belgian Congo. After vaccination no more cases of paralysis were reported in these localities.

BOOK REVIEWS

Diagnostic Anatomy. By Weston D. Gardner, M.D., Associate Professor of Anatomy, Marquette University School of Medicine, Milwaukee. Cloth. $10. Pp. 376, with 20 illustrations. C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, 1958.

Diagnostic anatomy is a new concept in an anatomy textbook, and the author is to be congratulated on presenting this type of book. The object of the monograph is to link the book with the physical examination of the patient. It is felt that a correlated approach to certain aspects of regional gross and topographic anatomy, based on the techniques, sequence, and problems faced by the physician in the physical examination, should be helpful to the student or practitioner who wishes to reacquaint himself with the anatomic features of the body he examines. The book is well written and easy to read. The printing is excellent. The illustrations, which are by the author, are line drawings demonstrating the desired points. It is regrettable that there are not more of them. Although the author states that surgeons are generally more anatomy-conscious than other physicians because they are concerned with anatomic dissections, the monograph should be valuable even to a surgeon, but it should be particularly valuable for those practitioners who come in contact with the anatomic structure of the body less frequently than surgeons. The book should be valuable also to students, especially in their course in physical diagnosis.

The Esophagus: Medical and Surgical Management. By Edward B. Benedict, M.D., F.A.C.S., Assistant Clinical Professor of Surgery, Harvard Medical School, Boston, and George L. Nardi, M.D., F.A.C.S., Clinical Associate in Surgery, Harvard Medical School. Foreword by Edward D. Churchill, M.D., F.A.C.S. Cloth. $15. Pp. 390, with 124 illustrations. Little, Brown & Company, 34 Beacon St., Boston 6; J. & A. Churchill, Ltd., 104 Gloucester Place, Portman Sq., London, W. 1, England, 1958.

This is a Boston book from cover to cover. That is all to the good, since the authors are surgeons and teachers of surgery in the Massachusetts General Hospital and Harvard Medical School. With thoracic surgery well established, it is amazing what advances have been made in a short time. The chest used to be a *noli me tangere*. One felt rather proud to make a diagnosis of cardiac, pulmonary, or esophageal lessions that could be confirmed at autopsy. Although we are still clamoring for early diagnosis so that surgery can have a better chance for cure, surgical conditions in the esophagus are not yet brought to the attention of the surgeon soon enough. The authors rightfully insist that difficulty in swallowing is a primordial and highly important symptom of carcinoma, but both patient and physician speak of indigestion, spasm, and a "funny feeling" behind the breast bone. No better phrase has originated in this century than "cancer alert." Both x-ray and direct vision with the esophagoscope are helpful in making an early diagnosis. Hence, we now have a better idea of short esophagus, varices, strictures, foreign bodies, and ulcers. The literature on the esophagus is filled with monographs on various conditions, but, since it is difficult to look up so many references, having the etiology, symptoms, pathology, complications, and treatment all under one cover is a great help to the physician and especially the gastroenterologist. What to do must always require careful judgment. How to do it is well illustrated by the numerous and excellent drawings, photographs, and color plates in this book.

Reflexogenic Areas of the Cardiovascular System. By C. Heymans, M.D., Professor of Pharmacology, University of Ghent, Belgium, and E. Neil, M.D., D.Sc., John Astor Professor of Physiology, University of London, Middlesex Hospital Medical School, London. Cloth. $10. Pp. 271, with 89 illustrations. Little, Brown & Company, 34 Beacon St., Boston 6, 1958.

The senior author of this book is a Nobel prize laureate and the discoverer of the chemoreceptor action of the carotid and aortic bodies. This book gives not only a critical evaluation of the physiology of the sinoaortic receptors but also a survey of cardiovascular reflexes in an attempt to correlate the latter with definite receptors characterized by anatomic localization and physiological function. Although the bulk of the work is based on the discussion of physiological investigations, the anatomic and embryologic basis is adequately covered. The problem of neurogenic hypertension (resulting from elimination of the sinoaortic receptors) is dealt with in a brief chapter. There is much material in this book of great value to investigators interested in cardiovascular physiology, respiration, and the neurophysiology of receptors. The text is well printed and provided with excellent illustrations, an extensive bibliography, and a short index. Since parts of the book are difficult to read, it is regrettable that there are no summaries. Criticism is frequently presented with unusual vigor. Certain data in the literature are found to be "exasperating."

These book reviews have been prepared by competent authorities but do not represent the opinions of any medical or other organization unless specifically so stated.

The authors speak of the "illogicality" of an argument and say that even Claude Bernard "rashly concluded." On the other hand, with reference to his own work, the junior author writes (p. 184): "Recently Green and Neil (unpublished) have proved." These are unfortunate defects in an important book. They are mentioned because they are bound to weaken the trust in the arguments of the authors.

Neuropathology. By J. G. Greenfield, M.D., F.R.C.P., LL.D., and others. Cloth. $20. Pp. 640, with illustrations. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2; Edward Arnold (Publishers) Ltd., 41-43 Maddox St., London, W. 1, England, 1958.

This admirable volume of neuropathology appeared shortly after the death of the senior author, who was one of the world's outstanding neuropathologists; it is a vade mecum for those who wish to work in this interesting area. The book is easy to read, and its style is especially attractive. Greenfield expended great care in presenting details. He brought neuropathology back to being primarily concerned with the nervous elements of the nervous system. There is often, in neuropathology, a temptation to be distracted from the consideration of the nervous elements. This distraction is engendered by the impressiveness of the changes in supporting tissues. Greenfield points out in the introduction to the first chapter that the changes in glial cells and the inflammatory changes are really only secondary and that the primary concern is what happens to the neuronal elements and their processes. This is an indication of clear thinking and putting first things first. This volume is well illustrated with gross and microscopic pictures. The illustrations are all black and white but are so vivid that one can not criticize the lack of colored photography. A minor criticism of the book is that the illustrations are numbered in a rather unusual fashion, so that one has to use some care in finding the proper illustration. This book should be of great value to all serious students of pathology or of the nervous system.

Religious Doctrine and Medical Practice. By Richard Thomas Barton, M.B., B.S., M.D. Foreword by Raymond B. Allen, M.D. Cloth. $3.75. Pp. 94. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1958.

This book is "designed to provide a reference for questions of religious dogma as they pertain to the practice of medicine." The author had the advice of members of the religions about which he writes. Consequently it may be assumed that there are no gross errors of dogma or its application, but so short a book must necessarily be limited to a consideration of only a limited number of matters—those considered by the author to be of major importance. Religious principles are discussed with the religious interest of the patient in mind. The book will serve a useful purpose if it does no more than remind the physician or nurse that the patient may have religious obligations or wishes the observance of which will not interfere with, but on the contrary may aid, medical care. It should, however, not be accepted as an authoritative treatise for the interpretation of religious dogma. The book contains a brief readable history and a brief discussion of some of the principle doctrines and practices of Hinduism, Buddhism, Judaism, Islam, Bahai faith, Roman Catholicism, Christian Protestantism, Mormonism, Jehovah's Witnesses, Seventh-day Adventism, Disciples of Christ, Christian Science, and Unitarianism.

Obstetrics and Gynecology. By J. Robert Willson, M.D., Professor and Head of Department of Obstetrics and Gynecology, Temple University School of Medicine, Philadelphia, Clayton T. Beecham, M.D., Clinical Professor of Obstetrics and Gynecology, Temple University School of Medicine, Isador Forman, M.D., Clinical Professor of Obstetrics and Gynecology, Temple University School of Medicine, and Elsie Reid Carrington, M.D., Assistant Professor of Obstetrics and Gynecology. Temple University School of Medicine. Cloth. $10.75. Pp. 605, with 267 illustrations. C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, 1958.

This book is the outgrowth of a mimeographed summary of the contents of courses in obstetrics and gynecology given to third-year and fourth-year medical students. The authors wrote the book to occupy a place between the large encyclopedic textbooks and the synopses devoted to these subjects. In this book, the authors have tried to include the essentials of obstetrics and gynecology and in this have largely succeeded, but, as may be expected when four experienced teachers write one book and the amount of space devoted to each subject is limited, there is sketchiness and unevenness. There are 51 chapters, each of which has a list of references at the end. The illustrations are abundant and instructive. Many have been borrowed from books written by Willson and the late Paul Titus. The advice given throughout the book is excellent and conservative. This is to be expected, because all four contributors are authorities in their specialties. This book should appeal to medical students, interns, and residents as a handy reference book for detailed information about obstetrics and gynecology. General practitioners and surely specialists will have to use the larger textbooks.

QUESTIONS AND ANSWERS

SLEEPING POSITIONS OF CHILDREN

TO THE EDITOR:—*Please comment on the advantages and disadvantages of having infants and children, normal or with upper or lower respiratory infection, lie on the stomach (postural drainage) for short or long periods of time. Is there any possibility of deformation of the thoracic bony structures in these infants?*

P. E. Gauthier, M.D., Montreal, Canada.

ANSWER.—The majority of infants sleep on their stomachs routinely, as they seem to rest more comfortably in this position. Older children sleep in a variety of positions. Children of any age will sleep more comfortably on their stomachs when they have the ordinary upper and lower respiratory infections. It is thought that this is due to the benefits of postural drainage. During the acute phase of pneumonia and other more severe lower respiratory tract infections, children are usually more comfortable in a partial Fowler's position. Once the acute phase has passed and secretions become more of a problem than gas exchange, postural drainage seems to be helpful. There is no evidence that sleeping on the stomach will influence in any way the development of the thoracic cage. There have been some suggestions that this position may predispose to positional deformities of the lower extremities. However, most pediatricians, after watching many children grow perfectly normally, feel that there is absolutely no connection.

ANSWER.—The normal infant and child should be given the freedom to assume any position in recumbency, i. e., prone, supine, or on either side. There is no basis for the thought that such practice will contribute to "deformation of the thoracic bony structures." When lower respiratory infections prevail, coughing is a defensive mechanism. The prone position in this instance is a significant advantage for drainage. The duration of such infections is usually not prolonged, and the time spent in the prone position does not promote the development of thoracic deformities. The incidence of tuberculosis of the spine in childhood is now very low. When present, recumbency is still indicated for a few months. For alternate hours the patient necessarily remains in the prone or supine position in some form of apparatus to restrict motion of the spine. In such cases there is a tendency for the thorax to lose its normal contours, i. e., the anteroposterior diameter may become less and the transverse diameter proportionately increased. Such a change may be retarded or prevented by the use of anteroposterior plaster shells.

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply. Anonymous communications cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

BROMHIDROSIS

TO THE EDITOR:—*A 55-year-old man says his wife, and apparently several other persons, have noticed a peculiar odor over his forearms, hands, and shoulders. This is not a matter of personal cleanliness, as the odor may be apparent immediately after bathing. The odor has been described as fishy, musty, and like that of sardines or lutfisk. He has been examined exhaustively, and nothing of note has been found. Liver and renal function are both adequate. When the odor is present, it usually persists several hours and fades gradually.*

William A. O'Brien, M.D., Minneapolis.

ANSWER.—Bromhidrosis is the name applied to excretion of malodorous perspiration. This may resemble many of the unpleasant odors encountered in nature. Offensive odors may be noted in certain systemic diseases associated with excessive perspiration and in generalized dermatoses in which there is an admixture of scales, crusts, pus, bacteria, and necrotic material. Another form is exogenous in origin and is due to the ingestion of certain drugs and foods. In such instances, the use of garlic, onions, and other seasonings should be avoided. Perhaps the "fishy" odor in this patient is suggestive of the causative factors, and he should avoid the ingestion of all fish and seafoods. The normal perspiration, both exocrine and apocrine, is devoid of any strong odor. According to Shelley and others (*A. M. A. Arch. Dermat. & Syph.* **68**:430, 1953), the action of bacteria on apocrine sweat produces the olfactory changes. In such instances, the odor can be prevented by hexachlorophene for as long as 18 hours. In one case, famous in dermatological annals, such an offensive odor in a patient was found to be due to a ring that he was wearing and elimination of the ring resulted in a permanent cure. The unpleasant odor may or may not be associated with **hyperhidrosis.** The treatment in this patient should be directed against bacteria with use of detergents containing hexachlorophene, and application of anhidrotics (such as aluminum chloride) and avoidance of malodorous ingestants (fish) should be tried.

BLOOD EXAMINATIONS WITH OXALATED BLOOD

To the Editor:—*It is a common practice for the technical staff to draw venous blood between 8 and 9 a. m. for chemical examination, determination of erythrocyte sedimentation rate (Wintrobe), and, frequently, complete blood cell count. An oxalate mixture is used as the anticoagulant in a vacuum tube. The blood is examined within 30 minutes after arrival in the laboratory. No platelet counts are done in this fashion. Does this technique give clinically useful results in regard to the complete blood cell count?* *H. Seibel, M.D., Brooklyn, N. Y.*

Answer.—The technique described is probably adequate for the determination of red blood cell counts and hemoglobin level. The resultant white blood cell count is probably somewhat lower because of the rupture of white cells in the vacuum tube. The technique would not be satisfactory for good blood films in part because of destruction of white blood cells and in part because of the unsatisfactory stain after the use of anticoagulants. Because of the effect of the oxalate, the hematocrit reading would also probably be inaccurate. In comparing results, it must be remembered that blood obtained in this fashion is venous blood and the results are not entirely comparable with the capillary blood obtained by finger puncture. The results, however, would be comparable when obtained by the same technique consistently.

ARTIFICIAL SWEETENING AGENTS

To the Editor:—*It has recently been said that the prolonged use of no-calorie sweeteners was harmful. What harmful effects might result from such use in general?* *M.D., Tennessee.*

Answer.—The conclusion of a report published by the Food Protection Committee of the Food and Nutrition Board (National Research Council, August, 1955) can be taken as reflecting the current attitude concerning the use of artificial sweetening agents: "There is no evidence that use of the nonnutritive sweeteners, saccharin and cyclamate, for special dietary purposes is hazardous. In the case of cyclamate, unrestricted use in foods and beverages may result in the formation of soft stools, but probably without interference with other functions of the intestine and without hazard to health. No data have been presented as to the minimum laxative dose of cyclamate for children, but it is reasonable to assume that this dose is lower than for adults. The maximal amount of saccharin likely to be consumed is not hazardous. No adverse synergistic effect was observed in combinations of saccharin and cyclamate as tested. These materials should be subject to continuing observation for possible deleterious effects under prolonged and varying conditions of use and should be reappraised whenever indicated by advances in knowledge."

ANTICOAGULANT THERAPY

To the Editor:—*A 65-year-old man has moderate essential hypertension and generalized arteriosclerosis. He recently had a mild cerebrovascular accident, characterized by paresis of the right upper and lower extremities, and is gradually improving six weeks after the accident. Would it be advisable to institute anticoagulant therapy on a long-term basis for prophylaxis of further thrombotic episodes of the cerebral vessels? Also, would it be advisable to use rutin and one of the citrus flavinoid compounds?* *M.D., Ohio.*

Answer.—Anticoagulants should never be used in any form of therapy unless (1) the patient will consistently and scrupulously follow the doctor's directions and (2) accurate laboratory facilities are available to measure prothrombin time. There is no unequivocal evidence that treating elderly patients with generalized arteriosclerosis and hypertension will be of any value in preventing subsequent strokes, though there are enthusiastic supporters of this form of therapy. Direct treatment of the hypertension with methods aimed at lowering the blood cholesterol level and general hygienic care probably constitute the best available therapy at the present time. There is no evidence that flavinoids or rutin are of any value in the circumstances outlined or in other clinical conditions for which they have been recommended enthusiastically but not critically.

POLLEN FILTERS

To the Editor:—*Please give information and references on the most effective air-conditioning filter system for removal of pollen during hay-fever season, particularly the ragweed and grass pollens occurring in the Wisconsin area in June, July, August, and most of September.*

M.D., Wisconsin.

Answer.—There are numerous excellent filters on the market being used in air-conditioning equipment. It would be impossible to give an unbiased appraisal of any particular brand. Since ragweed pollen measures 15-20 μ in diameter, almost any good impingement filter would be effective to some degree. The Air Processing Committee (a subcommittee of the Committee on Air-borne Allergens) of the American Academy of Allergy has been studying this problem and testing filters and air-conditioning equipment for several years. In its most recent report (*J. Allergy* **28**:455, 1957), a combination of an impingement type of filter in conjunction with an electrostatic precipitator type is recommended. Such devices have been described by

Novey and co-workers (*J. Allergy* **27**:398, 1956) and Friedlaender and Friedlaender (*Ann. Allergy* **12**:419, 1954).

USE OF OLD SURPLUS THIOPENTAL SODIUM

To the Editor:—*Does thiopental sodium deteriorate in the ampuls? A hospital recently acquired a supply of thiopental, a surplus item, which had originally been furnished to the U. S. Army in February, 1945. Is it safe to use it intravenously for anesthesia?*

Duncan C. McKeever, M.D., Houston, Texas

Answer.—This question is difficult to answer, since the factors concerned in the storage are unknown. However, tests on ampuls of this vintage only a year ago showed that the thiopental did not deteriorate to any great degree and that the toxicity did not increase with the passage of time when the ampuls were properly stored. Excessive heat and excessive light may accelerate deterioration, but more deleterious than this would be the minor breaks that occur in many types of ampuls. The skilled individual could make a solution of this particular vial, and, if it appeared to the naked eye to be normal, that is, if there was no clouding or precipitation, it would be considered safe to use. However, alterations in color and clarity would indicate that the ampul should be discarded.

PARALYSIS AGITANS

To the Editor:—*Is any form of paralysis agitans (Parkinson's disease) communicable?*

M.D., Pennsylvania.

Answer.—Paralysis agitans is not communicable. This clinical neurological syndrome may be the result of a wide variety of etiological agents. These agents include such infections as encephalitis and (rarely) syphilis. In most instances, paralysis agitans occurs long after initial infection, and transmission of the initial etiological agent is improbable at the time of the clinical manifestation of the disease syndrome.

VON GIERKE'S DISEASE

To the Editor:—*Please supply information on the use of pituitary extract to increase the growth of a 13-year-old boy with diagnosed Von Gierke's disease. His present height is 47 in. (88.9 cm.) and his weight 47 lb. (21.3 kg.). What other regimen of treatment might be of value?*

Henry G. Kurz, M.D., La Habra, Calif.

Answer.—The literature on this condition is not voluminous. The most illuminating article that has come to this consultant's attention is "Effect of the Menarche on Hepatomegaly in Pubescent Girl with Syndrome Resembling Glycogen Disease" (Esselborn and others, *J. Clin. Endocrinol.* **10**:339, 1950). On the basis of this and general considerations, this boy could be given gonadotropins, either equine or chorionic or these in alternation, thyroid in tolerance doses, and methyltestosterone, 10 mg. sublingually twice daily; also, cortisone might be tried. None of these, nor all of them together, offer any great promise. Pituitary growth hormone should be useful when effective preparations are available.

PROGRESSIVE PIGMENTARY DERMATOSIS

To the Editor:—*A query on progressive pigmentary dermatosis appeared in* The Journal, *Aug. 23, 1958, page 2161. Current textbooks, such as those by Sutton, Ormsby, and Montgomery, do not touch on the etiology and pathogenesis of this condition, and only Sutton suggested the use of x-ray treatment. Progressive pigmentary dermatosis (Schamberg's disease) is due to a clear-cut deficiency of vitamin C, and, as such, it is an etiological equivalent of scurvy. The treatment with vitamin C, 150 mg. given three times a day until the lesions disappear, is efficient in every instance. In my experience, the patients with this disease had not had citrus fruits in their diet for years. This deficiency in the patient's diet should be, of course, eliminated.*

Tibor Benedek, M.D.
25 E. Washington St.
Chicago 2.

The above comment was referred to the consultant who answered the original question, and his reply follows.—Ed.

To the Editor:—*The group of dermatoses to which progressive pigmentary dermatosis belongs, and which includes purpura annularis telangiectodes (Majocchi's disease), Gougerot's syndrome, and Blum's disease, is noted, among other changes, for purpura. The purpuric lesions are small and often punctate and yet unlike the early follicular forms seen on the lower extremities in scurvy. Overt manifestations of scurvy in the above group, such as swollen and bleeding gums, are lacking. Nevertheless, progressive pigmentary dermatosis and related entities (some believe they are clinical variants of one disorder) may have a direct or indirect basis in a relative vitamin C deficiency. This should be easily verified in the clinical laboratory. This consultant is not aware of any reports on blood vitamin C levels in progressive pigmentary dermatosis. If the simple measure of vitamin C administration will suffice to clear this group of purpuric dermatoses, it is a welcome therapeutic suggestion and will be received gratefully.*